

**MINISTRY OF HEALTH & FAMILY WELFARE  
(GOVT. OF INDIA)**

**ALL INDIA INSTITUTE OF AYURVEDA (AIIA), NEW DELHI**

**Tender**

**for**

**Supply, Installation, Testing & Commissioning of CSSD System at  
All India Institute of Ayurveda (AIIA), Sarita Vihar, New Delhi**

**VOLUME – III**

**TECHNICAL SPECIFICATION**

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**Tender No. HSCC/SES/AIIA/CSSD/2013**

## TECHNICAL SPECIFICATION OF CSSD EQUIPMENTS

**Scope of Work :** Supply, installation, testing and commissioning and handover of complete CSSD to hospital including all accessories and auxiliary items in accordance with the specifications, bill of quantities including Turnkey work and providing of free spare parts and service during 2 year Defect Liability Period

### 1. HORIZONTAL RECTANGULAR DOUBLE DOOR AUTOCLAVE

**Size - 600 x 600 x 1200mm (Minimum Capacity)**

The sterilizer should have **sterilization at temperatures 134°C and 121°C.**

The sterilizer is conforming to the following standards:

- IS 3829 (Part-I)
  - ISO certified 9001 : 2008
  - ISO certify 13485 : 2003
  - CE certified
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- **Fully automatic** and Microprocessor controlled, User friendly Alpha-numerical / Graphical / Digital type display and Display of Cycle status Fault/Error Indication with visual alarms.
  - The normal working pressure would be 1.2 - 2.1 Kg/cm<sup>2</sup> corresponding to temperature 121 - 134°C.
  - **Sterilize** Surgical instruments, textiles and hospital utensils.
  - The **Jacket** of the sterilizer should be of the channel type for providing additional strength to the chamber and made of Boiler graded steel/Stainless steel.
  - The **Chamber** of **size - 600 x 600 x 1200mm** (Minimum capacity) should be constructed of AISI-316 Stainless steel and jacket should be constructed of boiler quality steel.
  - The **structure** of the sterilizer would be made of stainless steel and would be adjustable for uneven floor surfaces.
  - The Chamber and jacket should be **insulated** with Chloride free mineral wool which should be covered under rigid, removable steel housings.
  - The Sliding/hinged **Doors** made of AISI-316 Stainless steel should be with automatic door sealing. The door sealing system should be with Silicon gasket with a stainless steel spring fitted into a groove of the sterilizer chamber.
  - The **Safety features** as the Sterilizer operation cannot commence until the door is fully closed, the door cannot be opened until the sterilizing cycle is fully completed and the chamber is effectively vented to atmosphere before the opening mechanism is fully released.

- All **Steam Piping** should be made of stainless steel with TIG welding joints.
- The sterilizer should be equipped with :
  - Chamber Drain Temperature Sensor for steam processes
  - Chamber Pressure Sensor\*
  - Temperature sensors should be PT 100 type
- \* Pressure sensors should have software based temperature compensation. Accuracy of 1% over the range 0 to 5 bar.
- **Alarm System** for:
  - Failure of Temperature and pressure sensor
  - Phase time out
  - Not properly closing of door
  - Power failure
  - Low water level
  - checking of all safety devices continuously
- Both the chamber and the jacket should be equipped with **Safety Valves**. If the pressure exceeds the allowable limit the safety valves should discharge steam.
- The Sterilizer should be equipped with liquid-ring **Vacuum Pump** to create vacuum for total evacuation of the air from the chamber in the shortest time.
- The Sterilizer should be provided with following mountings & fittings:
  - Fully Automatic with pre-selected and variable programs
  - Self sterilizing vacuum drier.
  - Safety valve spring loaded and vacuum breaker.
  - Pressure and compound gauge
  - Screen plug for chamber discharge line.
  - Chamber discharge line with team trap and swing check valve.
- The **operation** of the sterilizer should be activated by means of **solenoid valve**
- The Sterilizer should be fitted with **Control Panels** of Stainless steel construction where discharged steam from the autoclave on opening of the door cannot impinge on it. The Control Panel contains the control system and associated circuitry. Each circuit should be protected by a miniature circuit breaker. All electrical components in the control panel should be labeled. All wiring should be insulated and labeled to link with the circuit wiring diagrams and should be resistant to conditions of high humidity and heat, eg. PVC and silicon insulated wires.

- The **controls** must be capable of controlling automatically the following:
  - P1-Wrapped instruments, textiles, porous load - 134°C
  - P2-Heat sanities material, rubber, plastic porous load - 121°C
  - P3Sterilization for open instruments - 134°C
  - P4-Bowie & Dick Test cycle - 134°C
  - P5-Automatic leak test
- The Sterilizer system is incorporated with PLC based microprocessor with the facility of Human-Machine-Interface.
- The technician can program the cycles with his choice of different settings of time, temperature and corresponding pressure, which can be used to sterilize various types of contents / materials.
- The **Micro-Processor based control Panel** should control entire cycle of sterilization and steam pulsing automatically through water ring vacuum pump. The control panel should house the complete automatic process control arrangement including timers, relays, contactors etc.

The digital display at front panel should show the following parameters:

- Chamber Pressure
  - Chamber temperature
  - Cycle no.
  - Batch no.
  - Time & Date
  - Alarm indicator
  - Error code
  - Low water indicator
- **Printer** that should monitor and record dates, time of day, load, identification no. and operating parameters i.e. temperature, pressure and residence time automatically and continuously throughout the sterilization cycles
  - The Sterilizer should have built-in **Steam Generator** fitted below the sterilizer chamber. The Steam Generator pressure vessel should be made of AISI-316 Stainless steel and should be insulated in 50mm Chlorine free mineral wool enclosed in a rigid removable steel sheet housing. A water level **Gauge glass** for inspection should be provided with Steam Generator. The unit should be fitted with elements made of Stainless steel.
  - Electrically heated
  - **The Chamber, Jacket and Steam Generator should be hydraulically tested at the pressure twice of the working pressure**

## 2. TROLLEY

SIZE-600X600X1200 mm

MOC-Stainless Steel-304

Equipped with four swiveling castor wheels

### 3. TROLLEY WASH UNIT

The trolley washer Stationary type shall be used to wash and disinfect the transfer trolley, closed transfer trolley, which returns from hospital ward. This also should wash Basket Tray etc. Hot and cold water mixing arrangement should be equipped with the unit for cleaning application. And Jet system with flow control for intensive cleaning, Soap, disinfect for flow arrangement.

### 4. ETHYLENE OXIDE STERILIZER (ETO)

- **Chamber** made of anti-corrosive AISI- 316 Stainless steel. **Size- 600 x 600 x 900mm**  
The inner surface of the chamber should be smoothly finished to minimize gas deposit. Chamber should be heated with Strip air heater / Hot water circulated through the coil of AISI-304 around the chamber to maintain the chamber temperature at 40 – 75°C. The chamber should be insulated by 50 mm thick R.B. fibre glass/R.B glass wool covered by Stainless Steel-304. Silicon door gasket
- Working pressure of 30" Hg to 1.2 kg/cm<sup>2</sup>.
- **Door**( Single) made of AISI-316 Sliding/Swing with quick release locking arrangement process with suitable safety interlock so that the process cannot start unless the door is properly closed and cannot be opened during operation.
- Box typed **Panel** made of AISI – 304 Stainless steel sheet with arrangement of MMI-PLC.
- Diaphragm/Water ring type **Vacuum Pump** provided to achieve high level of air removal for high sterility and efficient residual gas removal during aeration process from the chamber and gas trap to separate and evacuate the gas. Inbuilt Gas catalytic converter for the exhausted ETO gas. Emergency evacuation phase for fast evacuation of gas in case of emergencies
- **Gas Purging** provided with cartridge puncturing system as well as provision for ETO +CO<sub>2</sub> cylinder.
- **Fully automatic models** for Sterilization process.
- **Stand** should be of AISI-304 Stainless steel.
- **Thermal Printer/Dot-matrix printer** which should print date, batch/ load number, program type elected and program parameters which includes one point pressure and one point temperature print out.
- Following **programs** with variable parameters should be provided to take user's requirement. Fully automatic operation.
  - Positive Pressure Cycle (with ETO (20%) + CO<sub>2</sub> (80%) cylinder.
  - Negative Pressure Cycle (100% ETO Cartridge)
- Microprocessor based Process control System (PCS)  
The control system should provide following features :
  - High and Low temperature and pressure alarms
  - Capability of storing and running upto 6 different programmes

- All process parameters can be easily changed
  - Pass-word protection to prevent unauthorized access.
  - Data Acquisition Systems for process Log and report
  - A Comprehensive selection of alarm functions should be also available
  - Medial failures (Gas, Water, Air, Steam, electricity)
  - Temperature and pressure alarms,
  - Time too long for different phases.
  - Gas leakage in the work,
  - Insufficient feeding of ETO Gas etc.
- **Accessories** - 1 no. Air Compressor
  - **Cartridges** - 100 Nos

## 5. WASHER DISINFECTOR

### SIZE – 600X600X800 mm

- Washer Disinfector, single door, suitable for **cleaning and disinfection** of surgical instruments, anesthetic equipment, suction bottles, cleaning buckets, general circulation goods, dental tray Feeding bottles, Kidney basins, Dressing bowls, Anesthesia tubing and glass should be with a fully closed process.
- **Fully automatic with advanced microprocessor based** which controls all services, programming and statistic functions. The service and programming functions should be coded for safety reasons. The control system should be housed in a cabinet attached on the main body of the machine.  
The salient features should be:
  - **Microprocessor** controller with easy to use.
  - **Preprogrammed** for simple use
 

PROG 1	:	Instruments
PROG 2	:	Kidney bowls/trays/basins.
PROG 3	:	Bottles
PROG 4	:	Tubing's
PROG 5	:	Vessel
PROG 6	:	Plastic/Rubber Goods
  - Time & Temperatures should be set by the user.
  - Possibility to repeat or skip a particular phase.
  - Password protection for un-authorized access.
  - Touch Screen Control panel
- The **door** should be provided with interlocking system and expansion type Silicon gasket seal.

- The **chamber** should be equipped with four spray arms which should ensure good water penetration from all directions. Other attachments should be provided to suit the load to be washed. Suitable dosage of detergent should be preset with the dosing pump.
- The **Circulating pump** should be driven by a TEFC, 3phase electric motor
- The **Wash chamber**, the inside the door, the pipe work system and the circulations arms should be made entirely of AISI-304 Stainless steel.
- Stainless steel (AISI-316) **Steam Generator** (9Kw) for automatic steam generation with automatic water feeding and pressure regulation.
- All **Piping** should be AISI-304 Stainless with TIG welding.
- **Hot Air Drying/Circulation System**
- **Electrical load** -13KW.
- Electrically operated

## 6. DRYING/HEATING CABINET SIZE-750X750X1500 mm

- **Digital timer** Controlled Drying Cabinet with single door suitable for easy and quick drying of instruments, utensils, glass should be and anesthetic accessories such as corrugated hoses, breathing masks, respiration bags and surgical instruments trays etc.
- The unit should be provided with **digital display** with countdown drying time and drying time selectors, temperature selector including indication of selected temperature.
- The drying cabinet should be provided with a **quick lock door** with heat resistant gasket expansion type Silicon.
- The chamber design should allow **uniform air circulation**. The air is circulated by a stainless steel impeller powered by a single-phase TEFC motor.
- The system should have **adjustable temperature** range of 60-90°C.
- The system should have **drying time** range of 0-90 minutes.
- **Timer** should be equipped with the system for Setting drying time.
- The **exhaust** should open to ensure complete removal of moisture
- The system should take air from the work should bea and clean it by appropriate **filter**. The air should be heated to an operator selected temperature by electric heating element. The system should also have an exhaust connection to vent outside.

- The unit should be provided with **Cassettes and protective shelves** for instruments, hoses, bladders and catheters as accessories.

## **7. ULTRASONIC CLEANER**

**SIZE- 500 X 300 X300mm**

- Cleaning by ultrasonic should promote extremely high degree of soil removal at very fast rate comp should be to other conventional methods of cleaning and penetrate into the most intricate and inaccessible should beas.
- The cleaning tank should be made of high grade stainless steel AISI-316.
- **Output frequency 35khz.**
- The unit should be complete with **single tank**, a **thermostat** and a **timer**, basket for tank and tank cover.
- Electrically operated

## **8. GAUZE CUTTING MACHINE**

**SIZE- 1500 X 650 X 850 mm**

- The thickest of Cotton gauze material should be cut smoothly.
- This machine should be operated with a Single phase motor and a knife sharpening unit that gives a finely honed edge to the cutting blade on the touch of a control lever/button.
- The motor cooling fan should be equipped to dissipate heat build-up and direct the hot air-flow away from the operator.
- Blade should be sharpened by the automatic sharpening unit only when the lever is pressed down.

## **9. WORK TABLE WITH SINK (Single)**

**SIZE-1800X900X650mm**

Wash station with Single sink unit should be of AISI-304 Stainless steel for washing and cleaning.

- Spray Gun Rinser connections – for washing of instruments.
- Complete stainless steel body construction, with four leg supports made of stainless Steel AISI-304 and bullets for adjustment, Table Top should be of 16 swg Stainless steel
- The Unit Complete should be with hot water, cold water and air spray for rinse provisions.
- Sinks of 16 swg thick SS-304 should be designed in a way to minimize splash.
- Rounded corners all around



## **10. WASH STATION (Double Sink)**

### **SIZE-2400x900 x 650mm**

Wash station with double sink unit should be of AISI-304 Stainless steel for washing and cleaning.

- Spray Gun Rinser connections – for washing of instruments.
- Complete stainless steel body construction, with four leg supports made of stainless Steel AISI-304 and bullets for adjustment, Table Top should be of 16 swg Stainless steel
- The Unit Complete should be with hot water, cold water and air spray for rinse provisions.
- Sinks of 16 swg thick SS-304 should be designed in a way to minimize splash.
- Rounded corners all around.
- One under shelf made of stainless steel SS304.

## **11. PACKING AND CONTROL TABLE WITH TWO SHELVES AND DRAWER Size - 1400X2000X1350mm**

- The height adjustable inspection and packaging table to be used for sorting, inspection and packing of various sets and for surgical instruments. The table top of the table is fabricated out of S.S. 304 and polished to a mat finish.
- The tabletop should be fixed on a Stainless steel AISI-304 squshould be/round tube frame. The frame should be provided with leveling lugs for suitable adjustment of height up to  $\pm 25$  mm.
- Drawer : 2 nos drawers made of Stainless steel -304

## **12. BASKET DISTRIBUTION TROLLEY**

Size – 1300X700X950 mm

MOC-Stainless Steel-304

Equipped with swiveling castor wheel-4 Nos

The distribution trolley shall be for distribution of the packed sterile goods from CSSD dept to Ward or contaminated goods from ward to CSSD dept in sterilizing baskets. The trolley should be designed for transporting up-to maximum baskets. The trolley should be fabricated out of stainless steel tubing ground and polished with horizontally mounted stainless steel bars for the baskets. The trolley should have two fixed castors in the front and two swiveling castors at the rear.

## **13. STORAGE RACKS**

**SIZE-1500X500X1500mm**

- Storage Rack of Stainless steel of AISI-304 with five shelves (Open type)
- Floor mounted
- Frames fabricated out of stainless steel.
- Shelves – made of stainless steel.
- Legs should be provided with adjustable nylon bulled feet.
- Five number 316 grade SS shelves dully reinforced and rounded off edges.

**14. DISTILLATION UNIT**

Capacity -10 LTRS.

MOC-Stainless Steel-304

Free standing, electrically operated unit should be capable of producing distilled water as per IP/BP standards. All contact parts shall be made of stainless steel. The unit should be fitted with ISI Marked immersion water heater, low water protection & electrical control box. It should be mounted on a sturdy MS tubular stand.

**15. TRANSFER TROLLEY WITH UNDER SHELVES**

SIZE-1500X600X900mm

MOC-Stainless Steel 304

The Closed transport trolley should be for transfer the sterile goods from CSSD dept to different dept in a completely closed cart. Sterile baskets, Dressing drum, Instrument tray/packets also shall be transferred. The trolley should be designed for transporting up-to 9 baskets. The trolley should be fabricated out of stainless steel tubing ground and polished with horizontally mounted stainless steel shelf's for transferring sterile goods. The trolley should have two fixed Brake type castors in the front and two swiveling castors at the rear.

**16. STAINLESS STEEL WORK TABLE**

SIZE-1200X650X900mm

MOC-Stainless Steel 304

The table top shall be fabricated out of S.S. 304 quality and ground and polished to a dull mirror finish. The table top shall be duly re-inforced against bending and treated for sound deadening. The under shelf fabricated out of S.S. 304 quality with beaded edge all duly buffed and polished and should be mounted at 300 mm above floor level. Width of the under shelf is 300MM. The tabletop shall be fixed on a S.S. square tube frame. The frame shall be provided with leveling lugs for suitable adjustment fo height up to +/-25 mm.

**17. FREE STANDING DOUBLE SIDE BASKET RACK-16 BASKET**

SIZE-850X650X2050 mm

The basket rack shall be manufactured as a modular system with storage consoles suitable for storage of sterilizing baskets made of steel profile 50x30 mm welded an both sides to a sturdy pillar made of steel profile 50x50 mm welded and the pillars should be joined together by support frame also made of steel profile .The pillar shall be mounted on adjustable feet suitable for adjusting + 25 mm. The entire rack shall be galvanised and finished smooth for easy handling and cleaning. Each section shall be suitable from storing of 16 in double basket racks.

**18. FREE STANDING SINGLE SIDE BASKET RACK -8 BASKET**  
SIZE-450x650x2050 mm

The basket rack shall be manufactured as a modular system with storage consoles suitable for storage of sterilizing baskets made of steel profile 50x30 mm welded on both sides to a sturdy pillar made of steel profile 50x50 mm welded and the pillars should be joined together by support frame also made of steel profile. The pillar shall be mounted on adjustable feet suitable for adjusting + 25 mm. The entire rack shall be galvanised and finished smooth for easy handling and cleaning. Each section shall be suitable for storing of 8 in single & 16 in double basket racks.

**19. STORAGE TANK**  
Capacity-120 LTRS  
MOC-Stainless Steel 304

**20. HALF SIZE STERILIZING BASKET**  
SIZE-585X395X95mm  
MOC-Stainless Steel 304

Basket shall be made of corrosion resistant SS wire with welded joints. Basket shall be adaptable with disinfectors, transfer carriage sterilizing and storage equipment.

**21. FULL SIZE STERILIZING BASKET**  
SIZE-585X395X190 mm  
MOC-Stainless Steel 304

Basket shall be made of corrosion resistant SS wire with welded joints. Basket shall be adaptable with disinfectors, transfer carriage sterilizing and storage equipment.

**22. HEAT SEALER – ROTARY TYPE**

- Suitable for hospital sterile packing
- Seals plastic film of various materials such as PE, PP, Aluminium foil etc.
- Emboss upto 15 interchangeable characters for batch recording, date etc
- Speed control mechanism
- Temperature control mechanism
- Height and width mechanism

- Sealing speed	:	1-12m/min
- Temperature Range	:	0-300deg.
- Cutting size	:	200 mm (8")
- Sealing width	:	6 – 15 mm
- Sealing film thickness	:	0.02 –0.80mm
- Conveyor loading	:	upto 5 kgs
- Power Supply	:	220-240 Volts, 50 Hz, Single Phase
- Size	:	900x420x660 mm

23. **IN ADDITION TO THE ABOVE, FOLLOWING TURNKEY WORK FOR INSTALLATION AND COMMISSIONING OF CSSD AT AYUSH, NEWDELHI SHOULD BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR :**

- Additional work pertaining to Civil, Electrical, Office, Store & CSSD Furniture, Plumbing, Overhead Water Tank, Sanitary, Servo stabilizers/U.P.S etc. and any other protections relevant as per State/Central Govt. regulation/local authority/NDMC, required for successful installation testing and commissioning of the system and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order in package on a “turnkey basis”.
- Installation and commissioning of **Water Softener** for softening of available ground/supply water continuously at the hardness necessary for washing and other application required for Kitchen is at least “< 50 ppm” or as per suitability of the Steam Generators/equipment. The Water Softening System shall be installed in the capacity compatible to the requirement of CSSD equipments and system running for the assigned duration at fully loaded condition. The specimen of ground/supply water is available at the site of installation at AIIA, New Delhi for design and selection of Water Softening System.
- Laying of **GI water pipe line** with necessary taps, joints, elbows, Unions, Tees and valves of GI made and IS-1239 standard (Latest version) and of adequate sizes to feed total water requirement of the CSSD from the available source point in the hospital to the overhead tank and from the overhead tank to the installed machines'/users' ends at CSSD Room.
- **Electric distribution panel (EDP)** for the above CSSD equipment complete with all switchgears, wiring and controls etc complete as per specifications and drawings. (Switch gears of L&T/ Siemens/ ABB/GE or Schneider make )
- **Electrical cabling** of IS: 1554 standard and wiring as per IS : 732 standard and of adequate capacity to bear total electrical load required for CSSD works from **nearby MDB/Substation in the hospital** to the Electric Distributional Panel(EDP) of CSSD room and from the EDP to the corresponding load points.
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Light Points, Power points, Cool air Fans, Exhaust fan etc in the CSSD room. Number of **power point, bulbs/tube light** fixture apart from these supplies to the individual equipments with ELCB & MCB in the CSSD room. Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for Control Panel for CSSD.
- **Ventilation** with installation of Industrial Blowers/Blowers in the CSSD room is the responsibility of the contractor. Motor should be of suitable capacity, continuous duty S1 type of IS : 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/Crompton Greaves make.
- Arrangement for requisite **Fire Fighting** for the effective zone of CSSD

**In addition to the above mentioned equipment/appliances**, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the CSSD then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

#### **APPROVED MAKES FOR CSSD**

1.	Air Blower	SWAM/ EVEREST/ KAY/Beta
2.	Blower Motor	KIRLOSKAR/ NGEF/ SIEMENS/CROMPTON/ ABB
4.	Cable	GLOSTER/ UNIVERSAL/ NATIONAL/ KALINGA
6.	Aeration System	NORTON/ UEM/ V.K.ENVIROTECH/MM AQUA
8.	Butter Fly Valve	AUDCO/ KEYSTONE/ KSB/CRI
9.	Control Panel	L & T/ SIEMENS/ SCHNEIDER
10.	Valve	LEADER/ ZOLOTO / CRI
11.	PVC Pipe Class III with Fitting	FINOLEX/ SUPREME/ PRINCE/ ORI-PLAST
12.	G.I. / M.S. Pipe Heavy Class	TATA/ JINDAL(HISSAR)/ SAIL / SURYA PRAKASH
19.	MCCB/ Contactor/ Relay	L&T/ ABB/ SIEMENS/ SCHNEIDER
20.	Pressure Gauges	H.GURU / FIEBIG
21.	Stainless Steel	TATA/ SALEM/ JINDAL/ MUKUND/ BHAYANDER/ AMBICA

#### **Note :**

- **The bidder should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues**
- **The contractor shall be responsible for the complete works including submission of working drawing and walk through view.**
- **The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.**
- **Final electrical and pressure and other safety test, system test and calibration should be done by authorized person with test instruments.**
- **The contractor should provide all electrical accessories like cable wire, electrical outlets, switches etc, and they should be fire proof of reputed make, certified for electrical safety.**
- **Wherever makes have not been specified for certain items, the contractor should provide the same as per BIS and as per approval of HSCC.**

- **Training of personnel of the Institute should be 30 days at least by the contractor.**
- **The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Air Washing and Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation.**
- **The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for CSSD.**
- **The contractor should provide Third party quality certificate of the CSSD equipment from SGS/TUV/Lloyds saying as " Certifies that the CSSD equipment meets the technical specification and BOQ of the Contract".**