

Amendment-7

Name of Work: DESIGN, SUPPLY, INSTALLATION, COMMISSIONING AND O & M OF PNEUMATIC TUBE CONVEYOR SYSTEM at JIPMER, Puducherry

Reference: Tender no. HLL/ID/14/43 dtd 28.06.2014 (Re tender)

Clause 2.4 , Section IV Employer Requirements :-

The technical requirements in clause 2.4 Section IV , Employer requirements is amended as follows

2.4 TECHNICAL REQUIREMENTS

2.4.1 Main Controller:

The entire system has to be electronically controlled by microprocessors. The main control unit, which controls the sending process and the compressor unit, supervises all system components.

The sending process has to be indicated on display devices. The device also has to provide information to find the cause of a system malfunction. Customer-specific data such as the system's layout, target numbers, target names, arrival signals, priority and special functions must be selectable on site without change or external reprogramming of memory devices. A integrated uninterrupted power supply must provide the requested system back up time to paste all date before shutting down the system, so after power source is providing energy again a automatic system start will occur and the system status will get back in the operation mode as before. Chosen targets at stored containers must be kept in the memory to proceed them automatically after power failure restart.

All components of the pneumatic tube conveyor are constantly monitored; the operating software has to be based on action reaction control for any device. The status of each device can be checked by the master control unit. A test program must be included to automatically check, move and supervise all of the system's devices, or specific selected devices, by access via service code from the Station control panel.

During both normal operation and testing, all devices inform the master control unit that the selected functional position has been reached. This ensures that this position truly has been reached. The system is designed in such a way that it does not allow the unobserved pivoting of devices.

The system has to come with an efficient fault-clearance program that automatically recognizes operating errors, power failures, time-out errors and other system errors. It also allows the system to continue functioning; there is no need for the operating personnel to intervene.

Facility to redirect empty containers which have exceeded the pre-allocated distance limit to a Station for maintenance to be carried out shall be provided.

If required the main control unit should be able control more than 1 carrier in a single line (Multiple carrier line) to increase the capacity of the system.

It should include the following:-

- Main Control Unit Hardware for main controller, for maximum of 24 bus systems, for systems up from 128 devices and transfer zone.
- Main Control Unit Hardware - Router for "Main Control" with 4 ports for connection of several Main Control Units.
- Patchable for connection router to Main Control
- Main Control Unit – Dongle
- UPS Uninterruptable Power Supply for PC-Monitoring
- Software package for main controller includes the following:-
 - Software for one Line,
 - Extension Software for further lines,
 - Software for Multiple Carrier Transport,
 - Software for Code-Tag System/Transponder System,
 - Software for Scheduled On/Off/Follow me events of Individual Devices,
 - Software for Visualization & Editor for 1 Client,
 - Software for History & Evaluation,
 - Software for Carrier Maintenances,
 - Tube Message software,
 - Software for Device Maintenance,
 - Software for Individual Programming of Send/Receive Permissions for Users And /Or Groups Of Users,
- Patchable for Connection PC/Laptop to Power Control
- Power Supply Unit,
- Power Supply Kit External,
- Power Supply connecting cable for Power Control.
- Keyboard SCB2000/3 – Usable for Desktop Installation Only

2.4.2 Blower:

It should have a separate Blowers 2.3 kW, 3 phase 400v/50Hz, 2850 rpm, 220 mbar pressure, 5.1 m3/min for flow rate, with low noise, unidirectional rotation with electronic air switch to switch between compressed air and vacuum.

Each blower should be provided with Frequency Converter for Control of slow speed for sensitive laboratory samples by frequency control of Compressor. The blower should be set go up to 75Hz with the help of Frequency Converter.

Frequency converter should help the system to run on blowers of 2.6 Kw.

It should be provided with all the mounting accessories and soundproof enclosure.

2.4.3 Multiple Carrier Lines:

There should be 8 multiple carrier lines provided in the system for continuous IN and OUT Traffic. Each Multiple Carrier line should be capable of sending 8 to 10 carriers simultaneously.

2.4.4 Zoning including 8 Multiple Carrier Lines:

PTS should be divided into 20 zones including 8 multiple carrier lines.

2.4.5 Station 160mm - Pass Through Type:

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as pass-through station.

The Pneumatic Station should be able to send and receive carriers.

The conveying direction of the carriers should be both sided (single tube reversing principle).

Inserting a carrier into the Pneumatic Station and selecting a target number should be possible independent from system status.

The carrier should be loaded on the top side of the Pneumatic Station.

The Pneumatic Station should be controlled by the use of LCD display membrane key pad in non-critical areas and with integrated Touch Panel Display for the critical areas.

The Pneumatic Station should be made of Steel, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensing of the unit positions. There should not be any air exiting at the pneumatic station. Should be provided with RFID readers for carrier ID and inventory, to ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

The Pneumatic Station should have Air cushioned soft landing facility for arriving carrier to protect samples. Provided with carrier rack and receiving basket with cushion.

Dimensions: (80 x 50 x 50 cm) Approx. to occupy least possible space.

2.4.6 Station 160mm - Multi Receive and Multi Send Station for Laboratory:

The Pneumatic Station should be able to send and receive carriers from the same unit.

Inserting a carrier into the pneumatic station and selecting a target number should be possible independent from system status.

It should control the condition of the receiving station when sending to the selected receiving station is possible.

It should be Microprocessor-controlled.

The Lab and Pharmacy should be provided with Multi Receive and Multi Send Station to handle bulk loads.

It should be designed as a fully automatic dispatch and receiving unit and can only be used as end station.

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensing of the unit positions. With RFID readers for carrier ID and inventory, this should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

It should be built in a way that after a power failure it is self-examining and if necessary self-repairing.

It should have Air cushioned soft landing facility for arriving containers to protect samples.

It should be provided with carrier rack & PVC Slide bend, sliced from the top for soft landing of the samples.

Dimensions: 100 (H) x 32(W) x 30(D) cm approximate

2.4.7 Station 160mm - Multi Receive Station:

The Pneumatic Station should be able to receive carriers from the same unit should be Microprocessor-controlled.

The Blood Bank & Laboratory should be provided with Multi Receive Station to handle bulk loads.

It should be designed as a fully automatic receiving unit and can only be used as end station.

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self adjusting optical switches, with self adjusting maintenance free gaskets for noise less operations, contact less sensing of the unit positions.

It should be built in a way that after a power failure it is self-examining and if necessary self-repairing.

It should have a self-disturbance program, control of the condition of the unit and the course of operation make a safe operation possible.

It should ensure non-acceptance of any items than authorized carrier.

It should be provided with carrier rack & PVC Slide bend, sliced from the top for soft landing of the samples

Approximate Dimensions: Station Lift 53(H) x 34(W) x 31(D) cm,
Station Slide Valve 31(H) x 44(W) x 22(D) cm

2.4.8 Station 160mm - Multi Send Station

The Pneumatic Station should be able to send carriers from the same unit.

It should be Microprocessor-controlled.

The Blood Bank should be provided with Multi Send Station to handle bulk loads.

The Pneumatic Station should be controlled by the use of the LCD display membrane key pad in non- critical areas and with integrated Touch Panel Display, in the critical areas.

It should be designed as a fully automatic dispatch unit and can only be used as end station.

It should have mechanical features of:

- Self-adjusting maintenance-free gaskets
- Sturdy mechanism
- Contactless sensing of the unit positions
- Super dimensioned motor

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self adjusting optical switches, with self adjusting maintenance free gaskets for noise less operations, contact less sensing of the unit positions.

It should be built in a way that after a power failure it is self-examining and if necessary self-repairing.

It should have a self-disturbance program, control of the condition of the unit and the course of operation make a safe operation possible.

It should ensure non-acceptance of any items than authorized carrier.

It should be provided with carrier rack.

Dimensions: 113(H) x 48(W) x 38(D) cm Approximate.

2.4.9 Station 160mm – End Type:

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as end station.

The Pneumatic Station should be able to send and receive carriers.

Inserting a carrier into the Pneumatic Station and selecting a target number should be possible independent from system status.

The Pneumatic Station should be controlled by the use of LCD display membrane key pad in non-critical areas and with integrated Touch Panel Display for critical areas:

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less

operations, contact less sensing of the unit positions. There should not be any air exiting at the pneumatic station. With RFID readers for carrier ID and inventory, this should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

It should have Air cushioned soft landing facility for arriving carrier to protect samples. Provided with carrier rack and receiving basket with cushion.

Dimensions: (60 x 50 x 50 cm) Approx. to occupy least possible space.

2.4.10 Station 160mm – Linear Automatic unload:

The system should be provided with a Linear Automatic Unload Station.

It should be Ultra Compact Unit.

It should connect two multiple carrier lines which should provide continuous IN and OUT Traffic.

It should save 2 - 24/7 full time work equivalents in peak time.

It should save 1 – 24/7 full time work equivalent rest of day.

It should save tremendously space at Laboratory.

It should avoid risk of cross contamination.

It should be Fully automatic high capacity sending and receiving station.

When the carrier comes into the pneumatic station it should automatically open inside the stations (without exiting the station), sample bags should slide out, the carrier should automatically return to its origin pneumatic station based on RFID transponder technology.

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensing of the unit positions. With RFID readers for carrier ID and inventory, this should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

It should have Air cushioned soft landing facility for arriving containers to protect samples above the station, with the help of slide gate.

It should be provided with carrier rack & SS Slide for sample soft slide-landing.

2.4.11 Touch Screen Panel for Critical Areas:

PTS Stations of Critical areas i.e. ICU, OT, Pharmacy, Lab & Blood Bank should be provided 7" touch screen display with multifunctional operation screens in Pneumatic Station with the following features:

1. LCD display / 7" touch screen display with multifunctional operation screens
2. Touch panel operation via finger, safety gloves or styluses
3. Individual programmable user profiles and customized hotkeys
4. Individual authorization levels for personalized users profiles
5. Touch screen surface protection for easy cleaning addressees are individually programmable; Search button and addressee index simplify the usage.
6. *With integrated Bar Code Reader for Pharmacy Stations and Blood Bank Stations only.*

2.4.12 Inter Connector Zone System:

The system is provided with the State of the Art "Inter Connector Zone System" which provides an excellent throughput and has fast transfer capabilities.

Inter Connector Zone is the only system:

- That allows the Carrier containing Emergency Samples to overtake the other carriers.
- Has chambers with extra empty carriers and any user can call for it from the station, by simply dialing a number.
- That allows 9 carriers to shoot out from transfer zone, simultaneously.
- Having 32 storage units for different carriers.
- Keeps the storage units vacant for the Emergency Carriers.
- Having separation unit for multicarrier transport for wall mounting.
- Having concentration unit for multicarrier transport.
- Occupies a less space.
- Can connect up to 14 lines.

2.4.13 Forwarding Tube:

Forwarding tube should include the cost of cable and other tube mounting accessories as are required for networking between Pneumatic Stations. Every Station and Diverter must provide transparent tube.

The forwarding tube should be made of PVC of 160 mm OD x 153.6 mm ID. Good Physical tensile strength, general medium density, absorption of water, combustibility self-extinguishing.

2.4.14 Bends:

It should be of 90 deg. with radius not more than 800 mm (centre) with length approx 1.5 mtrs, for optimal space utilization, grey colour.

2.4.15 Composite System Cable:

It should not be localized and it should be imported with company brand name marked.

2.4.16 Inserts:

Eprouvette Bag PVC for holding vacutainers.

2.4.17 Diverter:

The forwarding tube diverter must provide one incoming and three outgoing delivery tubes. The Diverter must provide a smooth connection between incoming and outgoing tube, to prevent impact on transported items. A maintenance free belt driven rotary oscillating pipe has to be pneumatically sealed to the device housing, to prevent air loss, self-adjusting Teflon gaskets have to provide airtight operation in vacuum and pressure operation.

Dimensions: 115(H) x 50(W) x 40(D) cm Approximate

2.4.18 Carriers:

Carrier for hospital use should be with easy to operate swivel top mechanic, sealed load chamber, to prevent contamination of tubing in the unlikely event of spill of transported goods. This must be realized only by closing the sealed swivel top mechanism.

The "closed" position should be fastened in a lock-in position. The lid should be kept in this position by a spring force and has to be equipped with seals. Furthermore the design of the container must be done in a way that an open carrier can't be sent. Any carrier has to be equipped with two free programmable data transponder, system according to send receive device used by the manufacturer in the Pneumatic Stations send magazines. Transponders are used to electronically identify any carrier by a unique address and to offer the user automatic redistribution to home Pneumatic Station and optionally a second address for dedicated locations or special carrier use. The carriers must provide a easily visible wear and tear resistant colour coding system, which must be changeable also on site by the user without damage and not requiring special tools.

Inside-loading-dimension for Carrier Ø 160mm swivel top Ø115 x 400mm

Outer-dimension for Carrier Ø 160mm swivel top Ø150 x 420mm

With suitable holders of vaccutainers and a pair shuttle bung for each container.

2.4.19 Automatic Unload Carriers:

Automatic Unload carrier should be such that no manual handling be required.

The carrier should automatically unload at the Pneumatic Station then automatically close & go back to the origin Pneumatic Station.

The system should not accept an open carrier.

The carrier should also be able to open manually.

It should have at least two free programmable data transponder system.

Inside-loading-dimension for System Ø 160mm swivel top Ø110 x 260mm

2.4.20 RFID

The system shall be provided with RFID as a standard solution, to ensure proper management of Carriers including return of empty carriers. It should prevent anything other than the carrier to enter the system.