

Item No. 9**Technical Specification of Automatic & Computerized Single Car Test Rig**

1. **Description:** Computerised and automatic single car test rig to carry out all the air brake testing (single car) on LHB and ICF coaches as per enclosed test formats B&C also mentioned in concerned maintenance manual issued by RDSO so as to ensure proper functioning of air brake system of LHB & ICF coaches.
2. **Scope of Supply:** This covers supply and commissioning of described test rig (single car) to the entire satisfaction of the consignee. It should also have other additional accessories necessary for fully operational of machines when put in service.
3. **Contractual Features:** The test rig should be robust and should meet all the industrial standards having following:
 - a. Minimum 15 inch touch screen interface for graphics and visualization supported with data storage and acquisition system with laser printer.
 - b. Industrial highly reliable control system, solenoids, regulators, and filters.
 - c. Suitable software for individual test and auto test with long security.
 - d. Minimum 01 TB HDD or 512 GB SSD storage and data management and reporting system with security.
 - e. Printer port/USB port for external connectivity.
 - f. Battery status indicator and auto shutdown the system to protect the data loss.
 - g. Portable machine having 04 nos. of wheels (dia. Not less than 10 inches) among them 02 wheels with locking cum swivel arrangement with handle to manually pull/push the machine.
 - h. Machine should be complying with IP 66 standard.
 - i. The system should have accuracy in reading various pressure $\pm 0.05 \text{ kg/cm}^2$.
 - j. The test rig should have the provision to blow the brake pipe and pipe of rolling stock (coaches) at 08 - 10 kg/cm^2 before starting of the test.
4. **Description of material:**

Material	Quantity	Features	Required
Electro pneumatic pressure regulator Make: Danfoss/Siemens Gems/Festo	01 no.	Power Supply	24 \pm 2 V DC
		Weight	0-10 Kg
		Current	4-20 Amp
		Process Connection	1 inch
Electronic Pressure Sensor Make: Danfoss/Siemens Gems/Festo	07 nos.	Power Supply	24 \pm 2 V DC
		Weight	0-10 Kg
		Current	4-20 mA
		Process Connection	1 inch
Solenoid Valve with suitable process connection Make: Danfoss/Festo/Micro Pneumatic	10 nos.	Power Supply	24 \pm 2 V DC

Material	Quantity	Features	Required
Programmable Micro-programmable Controller (Make- Danfoss/Siemens)	01 no.	Programmable	
Battery	04 - 06 nos.	Voltage	6 ± 0.5 V
The power system should be testing of 06 coaches continuously	Nos.	Current	120 ± 4 Ah
Reservoir	01 nos.	Capacity	40 ± 5 Ltr.
Wheels	04 nos.	Metal	MS Housing
Pressure Regulators controlling moisture be provided adequately along with any other materials required making the system functional.			

5. Software Design Specification:

- a. While conducting single car test on the purchase the machine should have the provision read/record of pressure of auxiliary reservoir, control reservoir and brake cylinder of individual bogies.
- b. The test rig provides facility of recording and storing the testing parameter with side storage capacity the stored data can be transferred to other any device via USB and wireless Wi-Fi connectivity.
- c. The system should have entered rolling stock particular and other information system for which the test is planned to carry out also the test result for each test should be stored on board along with timestamp and operator's detail.
- d. The management information system should have various reports like test particulars of last tested rolling stock (coach) Distributor Valve wise report, Coach Type Report, Distributor Valve make wise report, etc. between all these reports should have criteria of retrieving data off between 2 dates and also summarized year wise reports.
- e. The gradual brake application and release test should have 7 (SEVEN) step verification for each step data recording should be incorporated.
- f. The various tests of above system of single car test to be conducted in sequential manner as laid down in the test procedure and should have the facility to conduct the test individually. Each test should have the result of either pass or fail which is to be recorded.

6. Safety:

- a. The described SCTR will have suitable storage capacity for years of recording online.
- b. The device should be equipped with all necessary safety device/guard such as overload protection device if required so that smooth operation of same can be insured an accident of accident during testing awarded.

- 7. Spare:** List of recommended spares for 2 years maintenance should be provided with detail of prices and quantities along with test rig.

8. **Operational and maintenance manual:** 04 numbers each should be supplied by the firm along with test rig before commissioning.
9. **Training:** To be imparted to sufficient number of staffs at premises of consignee free of cost during commissioning of machine.
10. **Installation commissioning and proving test:** On receipt of test rig the firm of his agent would be required to carry out joint check at the consignees and along with the consignee before unpacking is done to avoid subsequent complaint regarding short shipment/transit damages necessary that this joint inspection to be done immediately on receipt of the machine by consignee and firm's representative to avoid commissioning delayed due to shortage/transit damages.
11. **Following item of work shall be performed by the supplier:**
 - a. Installation computerized and automated single car test rig in position.
 - b. Complete fitting and wiring of all electrical items.
 - c. Commissioning of the equipment.
12. **Warranty:** Each machine should have warranty for the period of 2 years from the date of commissioning the supplier will rectify all defects free of cost which may develop due to faulty design materials and workmanship including defective parts.