

ANNEXURE-1A : SPECIFICATION

Single Channel hydraulic structural loading system with the following features to carry out structural tests of composites products for launch vehicle and spacecraft applications.

1. Hydraulic pump with Directional Control valve

- a) Differential piston with single hand level Operated hydraulic pump along with hand operated rotary directional control valve as an integral part. Maximum working Pressure should be at least 7000psi.(48.2bar).
- b) The pump should provide considerably high displacement under low pressure for rapid travel of the jack and then automatically changes to low displacement (2.8cm³/stroke) when pressure increases above 3MPa for ease of operation the pump.
- c) Directional control valve should be with two outlet ports for switching the load in Tension and Compression through two sides of double acting cylinder.
- d) Pump should be suitable for Hydraulic mineral Oil VG 68 Grade or Servo 68. Oil viscosity shall be 30 to 300cst (0.003 to 0.03m²/s).
- e) Pump should have integral oil tank having capacity of minimum 8 Litres and oil tank displacement not less than 7 litres. There should be Filter/Air breather plug available.

Pump should be reputed make preferably from Enerpac/ Polyhydron/ Werner- Weitner/ Micropac.

2. Double acting Hydraulic actuator/jack

Hydraulic actuator shall be either standard from Parker/ Eaton/ Rexroth makes or custom made to serve the structural loading requirements

Hydraulic Jack 5T- Qty 1No

- a. Type – Double Acting
- b. Capacity – Minimum 50kN
- c. Stroke length – Minimum: 300mm
- d. Base Flange Size –Apprx. 160mm x 160mm
- e. Bottom Clevis pin diameter –Apprx. 50mm
- f. Working Pressure- 230Kg/cm² (22.6MPa)
- g. Jack ram should be hard chrome plated.
- h. Air bleed port head end with plug 4Nos
- i. Hydraulic low friction seals used should be from same manufacture or equivalent & reputed makes.

Hydraulic jacks should have Eye bolt provision for crane lifting, Low friction type seal, Air bleed ports with plugs, bottom flange and additional clevis as attachable to the flange. Proof pressure to be done at 1.5 times of working pressure (230kg/cm²) for 10 minutes hold. Necessary adaptors to be provided in the ports for connecting with QC/DC Couplings.

3. Manifold assembly for connecting hoses lines to the Hydraulic cylinder.

Manifold shall consist of fully assembled with necessary fittings for

- a. Safety relief valves (Qty 2Nos)
 - b. QC/DC Connector (Qty 2Nos) Carbon steel (Make: Parker/Holmbury/ CEJN/ Swagelok/ BuTech/ Hamlet)
 - c. Pressure transmitters (Qty 2Nos) Range- 0 to 400kg/cm² (40MPa) with 4 to 20mA loop powered output signal - Gefran/Danfoss/Wika/Yokogawa/Vega make.
 - d. 100mm Dial type Pressure Gauge (Qty 2Nos), Glycerine filled, Wika/Waree makes.
4. **Hydraulic Hoses**- 1/4" BSP FSN x 15 mtrs long – Qty 2Nos. to be provided of Parker or reputed makes along with Parker make fittings and necessary adaptors to connect with QC/DC Connectors.
 5. **QC/DC Connector set**– 6Nos to be provided as spare for connecting other jacks side in addition to the 2Nos specified in the manifold. QC/DC shall be of Carbon steel with trivalent plating, Nitrile seals, Locking ball system for quick connection, Bidirectional flow and dust cap (Make: Parker/Holmbury/ CEJN/ Swagelok/ BuTech/ Hamlet)
 6. **Hydraulic Oil**- VG48 Qty-20 Litres from reputed manufactures to be supplied.

ANNEXURE-1B CONDITIONS

1. Details to be submitted along with the offer:

- a. Configuration of the system meeting the specified requirements should be furnished with figures /drawings /working diagram.
- b. All hydraulic and electrical control circuits along with detailed list of components shall be furnished.
- c. All components should be from standard, reputed manufactures.
- d. Details of all standard components, make, model & part number should be given. Detailed technical catalogue of major items shall be submitted.

2. System Acceptance

Factory Acceptance Test (FAT) of the system at Vendor's work site will be carried out. Performance demonstration of the system in all respect should be carried out during FAT.

3. Installation

Installation of the system should be carried out at CMSE/VSSC, Trivandrum. Successful performance demonstration should be carried out after installation.

4. Warranty and service support

- a) The equipment shall be fully guaranteed for performance for 24 months from the date of commissioning and acceptance. A certificate to this effect shall be given to VSSC.
- b) Any defect observed during the guarantee period will have to be repaired/replaced free of cost with minimum down time.
- c) List of essential spare parts and their cost need to be furnished for reference purpose
- d) The Vendor shall provide commitment for after sale service and supply of spare parts for the offered equipment for a period of at least FIVE years.