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शिक्षा मंत्रालय के अधीन, भारत सरकार

IIT PALAKKAD

16-02-2021

CORRIGENDUM – I

Sub.: SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF HIGH CAPACITY UTM

Ref.: IITPKD/CE/GC/062/2020-21 dated 12-02-2021

The following revisions may please be noted in the Tender Document cited in the reference above.

References (Page No.1)

S. No.	Particulars	Link
1	Amendments to the Tender Document	https://iitpkd.ac.in/sites/default/files/purchase/01AmendmentstotheTenderDocument.pdf
2	Language / Format / Signing of the Bids	https://iitpkd.ac.in/sites/default/files/purchase/02LanguageFormatSigningoftheBids.pdf
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11	Format of Bank Guarantee	https://iitpkd.ac.in/sites/default/files/purchase/11FormatofBankGuarantee.pdf
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Technical Specifications of the Equipment

Brief Description:
A computer-controlled closed loop servo hydraulic universal testing machine to enable tensile and compressive tests. The setup should comprise of the following components:

A. Universal testing frame of 2000 kN static load capacity capable of doing both tension test on rounds and flat steel specimens, and compression test on concrete cubes and cylinder specimens

B. Servo-hydraulic power and control system including hydraulic power unit (HPU), servo valve, controller, and associated hardware.

Servo hydraulic power and control systems

1) Complying with recognized national and international standards such as BIS, ASTM, ISO wherever applicable.
2) Specification for the hydraulic power unit:

    a) Oil flow control through servo control valve

    b) Demand-dependent flow-rate control (variable pressure)

    c) Produce continuous non-pulsating oil flow at required pressure

    d) Should be able to connect at least two independent frames that can be operated independently

    e) Vibration free unit with noise levels $\leq$ 90-95 dB

3) Specification for the control system

    a) Multifunctional P.I.D. closed loop controller

    b) Capable of performing tests under load/stress, displacement/strain control.

    c) Loop-closure rate of at least 120 Hz.

    d) Rate of loading - Load control – 100 N/s or better, Displacement control – 0.1 μm/s or better.

    e) Resolution $\leq \pm1\%$ in the rate of loading.

    f) Rate of data acquisition should be 500 kHz or better.

4) a) User interface in the application software to select and operate the frame used for testing.

    b) System hardware should be integrated internally to the control unit.

5) a) System hardware should have minimum 6 additional channels, for connecting compatible external displacement transducers such as LVDT, CMOD, compressometers, strain gauges etc.

    b) It should be possible to select the test control parameter, from among the different load and displacement transducers connected during the test, with provision to switch control parameter dynamically during testing.

6) Should be suitable for operation on 230 V single phase AC or 415 V three phase AC, 50 Hz, power supply without any additional cooling requirements, and should be operational under ambient temperature of up to 40°C.

2000 capacity testing frame for tension and compression tests

7) a) 2000 kN capacity tension and compression frame with at least four rigid columns to ensure sufficient stiffness

b) Should have dual test space capable of performing both tension and compression test in the same frame

c) Controls for fast motion of the head for coarse adjustments, and separate controls for fine adjustments

d) Should conform to Machine class 1 range ISO 7500-1:2018(en)

e) Should have a front open cross head and hydraulic gripping arrangement

f) Should have a vertical daylight of minimum 750 mm or better

g) Should have a horizontal daylight of minimum 750 mm or better

(h) Vertical clearance should be adjustable from 75mm to 750 mm or better for tensile and compression test

(i) Piston stroke of 200 mm or better

(j) Deflection of the frame in the direction of loading at full scale ≤ 1.5 mm

8) Calibrated distance pieces, suitable for testing cubes of dimensions ranging from 100 mm – 200 mm and cylinders from 100 mm – 300 mm height, compatible with the piston travel limit should be provided.

9) Piston mounted strain gauge load cell having accuracy within the range of ±0.1% to ±1% of the read-out value throughout the measurement range is required.

10) a) Calibration certificate for load transducer should be provided

 b) Accessibility to the user to feed-in calibration data, of any compatible external transducer should be provided.

Accessories suitable to measure mechanical properties of steel rebars, wire strands, bolts, and flat plates

11) a) All accessories required to carry out tensile test on round samples of 10 mm to 60 mm diameter or better as per IS 1608:2005 or ISO 6892-1:2019(en) or ASTM A370 – 20

b) All accessories required to carry out tensile test on flat plate samples of thickness ≥ 75mm, and width ≥ 90 mm as per IS 1608:2005 or ISO 6892-1:2019(en) or ASTM A370 – 20

c) All accessories required to carry out tensile test on seven-wire strands of 6-15 mm nominal diameter and suitable grips as per IS 14268:2017 or ASTM-A 416 for tensile test

d) All accessories required to carry out bend and re-bend tests on rebars of up to 40 mm nominal diameters according to the specifications of IS 1599:2019 or ISO 7438:2016 or IS 1786:2008

e) All accessories required to carry out test on Bolts, Nuts testing fixture / attachment as per ASTM-F 606 M-07 or ISO: 898-1: 2013(en) or IS 1367 (Part 3):2017 suitable for bolt size up to 60mm diameter or better

12) 2 nos. of electronic Extensometer for each steel rebar and wire diameters mentioned in item 11. It should comply to 1 calibration class of ISO 9513:2012 with resolution of 0.01mm and accuracy ±1% or better

13) 3 nos. Electronic universal extensometer/compressometer for standard cylinder size up to 150 mm diameter × 300 mm height and for standard cube size up to 150 mm. It should comply to 1 calibration class of ISO 9513:2012 with resolution of 0.01mm and accuracy ±1% or better

14) Set of Compression Platen with spherical seats for compression test on standard concrete cube up to size 150mm x 150mm x 150mm and on concrete cylinder up to size 150mmx300mm

User interface and other support systems

15) a) User interface software for the DAQ should be licensed software and should be provided with the system.
b) All measurements, calculations and data storage functions should be automatic and controlled with a PC having minimal operator involvement.
c) PID control to be automated with minimal manual intervention

*In case the accessory has been procured from some other supplier, the same should be clearly stated and the OEM should be clearly identified in the technical specifications. In such cases, the compatibility of the accessory with the supplied equipment should be satisfactorily demonstrated at the time of calibration and installation.
** OEM – Original equipment manufacturer

All the other Terms and Conditions of Tender Document remain unaltered.

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