

Annexure 'A' Attachment to Solicitation No. S-IN650-12-Q-0091

1. Specifications

Input voltage range 300 – 460 volts,
3 phase 4 wire unbalanced voltage input, balanced output voltage and unbalanced load.

Output voltage 415 +/- 1%

Frequency variation 45- 55 Hz

Power factor >0.8 < .98

Waveform – original not distorted

Efficiency not less than <98%

Ambient temperature - -5⁰C to 50⁰C

Correction rate 5 to 20 volts per second.

Response time 10 ms

Duty cycle 24 hours continuous on 100% load

Control circuits – digital microprocessor type software operated control card for voltage sensor, controls and on line serviceability

Low internal impedance

Rolling Contact Type Voltage Controller

Low noise

AC Synchronous motor- bi-directional

Control panel - auto manual mode selection mode, output adjustment mode, voltmeter input / output, high / low indicator, display of events, tamper proof and pass word protected.

Natural oil cool type

- A. This specification covers electrical, mechanical, and safety features and characteristics of indoor, three phase, naturally oil cooled, oil-immersed, synchronous servo variable voltage regulators configured for 3 phase operation, 3 nos. single phase variable transformer individually driven by three individual servo motor. The voltage regulators must be completely self-contained and provide +/- 0.5% regulation. Forced air (FA) ratings are not acceptable.
- B. The regulators furnished under this specification shall be designed, manufactured and tested in accordance with ANSI Standard C57.15, latest revision thereof Or IS 9815. That standard shall be a part of this specification.
- C. All regulators rated for 1100 volts (1.5 KV) shall be provided with input variation 300 volt to 460 volts between phases (170 to 265 volts on single phase).
- D. The regulator shall be furnished with ANSI Type 11 mineral oil per ASTIVI D-3487. The oil shall contain less than 1 part per million PCBs at time of manufacture and this shall be so stated on the regulator nameplates.

0.1 **QUALITY ASSURANCE**

- A. National Fire Protection Association (NFPA): Conform to the requirements of IEEE, IEC Code."
- B. IS STANDARDS: Construct panel boards in conformance with the following. IS 8623-1977, IS 4237-1967, IS 2147-1962, IS 3619-1966, IS 5-1978, BS 162 publications.
 - 1. Cabinets and Boxes
 - 2. Control panels boards
 - 3. Electrical Quick-Connect Terminals

0.2 **SUBMITTALS**

- A. Sections 3, "Submittals," for additional requirements.
- B. Product Data: Submit manufacturer's data on voltage regulator including:
 - 1. Manufacturer's materials specifications.
 - 2. Certification for compliance with referenced standards.
 - 3. Enclosure type.
 - 4. Transformer and Variac Ampacity.
 - 5. Voltage Rating.
 - 7. Servo Control Motors
 - 8. A complete set of fabrication drawings
 - 9. Panel meters.

0.3 **STANDARD EXTERNAL FEATURES**

All regulators shall be provided with an external metal oxide varistor (MOV) bypass arrester connected across the series winding,

An external oil sight glass shall be provided which indicates oil level at 25 deg C ambient temperature,

All regulators shall have a 1" drain valve with sampling device.
A hand hole with cover shall be provided on top of the regulator for inspection purposes and for access to terminals used for reconnection of regulators.

The nameplates shall have the manufacturer code and serial number bar coded

2.1 **REGULATOR CONTROL**

The regulator control panel shall be mounted in a weather-resistant enclosure. The control panel shall be hinge-mounted and designed for easy inspection and replacement. The front panel assembly shall be constructed to provide direct control interchangeability without requiring removal of the control enclosure. All leads in the control shall be either color coded or labeled for easy identification.

All printed circuit boards shall be conformal coated for fungi and moisture protection.

A ratio correction transformer shall be provided inside the control enclosure for easy access to fine voltage adjustment. Ratio correction corresponding system voltage shall be clearly identified on the regulator nameplates.

The regulator control panel shall include the following items:

Digital microprocessor type pass word protected, tamper proof software operated controls cards for servo motors and correction of voltages, voltage set points, display of events etc.

Auto-manual mode shall selected through push buttons / switches, which allows automatic or manual operation of the regulator or allows the control to be turned off. Supervisory motor control shall be permitted only when the switch is in the AUTOMATIC position.

Manual mode RAISE-LOWER push button/ switch shall only be active when the regulators switch in manual position.

A high low cut of indicating light, which is actuated limit switch indication of variac position.

Separate motor and panel fuses, which are replaceable from the front panel.

Fuse size shall be clearly marked below each fuse. One set of spare fuses shall be included in the control enclosure.

Control knob locking devices which prevent inadvertent adjustment of settings.

The locking device shall be operable with a flat head screwdriver.

Set voltage bandwidth shall be adjustable from 1 to 6 volts in increments no larger than 0.5 volts.

2.2 **FIELD QUALITY CONTROL**

- A. Regulators shall be tested in accordance with the latest ANSI standards or latest IS standard.
- B. Test Objectives: To ensure transformer is operational within industry and manufacturer's tolerances, is installed according to IS standard
 - a. Test Labeling: On satisfactory completion of tests for voltage regulators, attach a dated and signed "Satisfactory Test" label to tested component.
 - b. Schedule tests and provide notification at least 14 days in advance of test commencement.

c. Report: Submit a written report of observations and tests. Report defective materials and installation.

C. Tests: Include the following minimum inspections and tests according to manufacturer's written instructions. Comply with IEEE C57.12.90 for test methods and data correction factors for liquid-filled units.

1. Inspect accessible components for cleanliness, mechanical and electrical integrity, and damage or deterioration. Verify that temporary shipping bracing has been removed. Include internal inspection through access panels and covers for dry-type transformers.
2. Inspect bolted electrical connections for tightness according to manufacturer's published torque values or, if not available, those specified in UL 486A and UL 486B.
3. Insulation Resistance: Perform ohmmeter tests of winding to winding and winding to ground.
4. Temperature Correction: Correct results for test temperature deviation from 20⁰ C standard.
5. Over potential Tests: Apply between high and low voltage and ground at not more than 85 percent of factory-test value for 1 minute.

D. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest. Verify that transformers meet specified requirements.

3. **CLEANING**

A. On completion of installation, inspect components. Remove paint splatters and other spots, dirt, and debris. Repair scratches and mars on finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

4. **ADJUSTING**

A. After installing and cleaning, touch up scratches and mars on finish to match original finish.

B. Adjust taps to provide optimum voltage conditions at utilization equipment throughout normal operating cycle of facility. Record primary and secondary voltages at various input level and unbalance load and submit with test results.

C. Occupancy Adjustment: When requested within 12 months of date of Substantial Completion, provide on-site assistance in readjusting settings to suit actual occupied conditions without additional cost.

1. Voltage Recordings: Contractor performed. Provide up to 48 hours of recording voltages.
2. Point of Measurement: Make voltage recordings at load outlets selected by Owner.
3. Safety precautions.
4. Features, construction and accessories.
5. Routine inspection, test, and maintenance procedures.
6. Routine cleaning.
7. Features, operation, and maintenance of integral protective devices.
8. Interpretation of readings of indicating and alarm devices.
9. Fuse selection.
10. Protective-relay setting considerations.
11. Features, operation, and maintenance of separable, insulated, connector system.
12. Tap-changing procedures.

5. **ADJUSTABLE TRIP SETTINGS**

- A. Verify factory settings for adjustable trip breakers.
- B. Field adjust in conformance with manufacturer's recommendations, if necessary.

6. **NAMEPLATES**

- A. Identification: Provide rigid engraved plastic nameplates conforming to the requirements of IS, "Electrical Identification," for voltage stabilizers.

Annexure 'B' - FAR & DOSAR CLAUSES

**CLAUSES FOR PURCHASE ORDERS AND BLANKET PURCHASE AGREEMENTS AWARDED BY OVERSEAS CONTRACTING ACTIVITIES
(Current thru FAC 2005-52)**

COMMERCIAL ITEMS

FAR 52.252-2 Clauses Incorporated By Reference (FEB 1998)

This purchase order or BPA incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: <http://www.acqnet.gov/far>

DOSAR clauses may be accessed at: <http://www.statebuy.state.gov/dosar/dosartoc.htm>

FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1) CLAUSES

NUMBER	TITLE	DATE
52.204-9	Personal Identity Verification of Contractor Personnel (if contractor requires physical access to a federally-controlled facility or access to a Federal information system)	JAN 2011
52.212-4	Contract Terms and Conditions – Commercial Items (Alternate I (OCT 2008) of 52.212-4 applies if the order is time-and-materials or labor-hour)	JUN 2010
52.225-19	Contractor Personnel in a Diplomatic or Consular Mission Outside the United States (applies to services at danger pay posts only)	MAR 2008
52.227-19	Commercial Computer Software License (if order is for software)	DEC 2007
52.228-3	Workers' Compensation Insurance (Defense Base Act) (if order is for services and contractor employees are covered by Defense Base Act insurance)	APR 1984
52.228-4	Workers' Compensation and War-Hazard Insurance (if order is for services and contractor employees are <u>not</u> covered by Defense Base Act insurance)	APR 1984

The following clause is provided in full text:

52.212-5 Contract Terms and Conditions Required to Implement Statutes or Executive Orders - Commercial Items (MAY 2011)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to

implement provisions of law or Executive orders applicable to acquisitions of commercial items:

- (1) 52.222-50, Combating Trafficking in Persons (FEB 2009) (U.S.C. 7104(g))
 _____ Alternate I (AUG 2007) of 52.222-50 (U.S.C. 7104(g))
- (2) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).
- (3) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Pub. L. 108-77, 108-78).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the contracting officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

[Contracting Officer check as appropriate]

	Clause Number and Title
	(1) 52.203-6, Restrictions on Subcontractor Sales to the Government (SEPT 2006), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402). <i>[Check if order exceeds \$150,000]</i>
√	(2) 52.203-13, Contractor Code of Business Ethics and Conduct (APR 2010) (Pub. L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note)).
	(3) – (24) [Reserved].
√	(25) 52.222-19, Child Labor – Cooperation with Authorities and Remedies (JUL 2010) (E.O. 13126). <i>[Check if order is for supplies and exceeds the micro-purchase threshold]</i>
	(26) 52.222-21, Prohibition of Segregated Facilities (FEB 1999). <i>[Check if the following apply: for supplies, the order exceeds \$10,000 and is awarded to a U.S. firm. For services, the order exceeds \$10,000 and is awarded to a U.S. firm whose employees who will be performing the work were recruited within the U.S.]</i>
	(27) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246). <i>[Check if the following apply: for supplies, the order exceeds \$10,000 and is awarded to a U.S. firm. For services, the order exceeds \$10,000 and is awarded to a U.S. firm whose employees who will be performing the work were recruited within the U.S.]</i>
	(28) 52.222-35, Equal Opportunity for Veterans (SEPT 2010) (38 U.S.C. 4212). <i>[Check if the following apply: for supplies, the order exceeds \$150,000 and is awarded to a U.S. firm. For services, the order exceeds \$150,000 and is awarded to a U.S. firm whose employees who will be performing the work were recruited within the U.S.]</i>
	(29) 52.222-36, Affirmative Action for Workers with Disabilities (OCT 2010) (29 U.S.C. 793). <i>[Check if the following apply: for supplies, the order exceeds \$10,000 and is awarded to a U.S. firm. For services, the order exceeds \$10,000 and is awarded to a U.S. firm whose employees who will be performing the work were recruited within the U.S.]</i>
	(30) 52.222-37, Employment Reports on Veterans (SEPT 2010) (38 U.S.C. 4212). <i>[Check if you have included the clause 52.222-35]</i>

	(31) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2010) (E.O. 13201) <i>[Check if the order is for services and the amount exceeds \$150,000]</i>
√	(32)(i) 52.222-50, Combating Trafficking in Persons (FEB 2009) <i>[Check for all orders]</i>
	(32)(ii) Alternate I of 52.222-50 <i>[Check if the contracting officer has been notified of specific U.S. directives or notices regarding combating trafficking in persons that apply to contractor employees]</i>
	(33) – (38) [Reserved].
	(39) 52.225-5, Trade Agreements (AUG 2009) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note). <i>[Check if the order is for supplies or services that involve the acquisition of supplies and the amount exceeds \$203,000]</i>
	(40) 52.225-13, Restrictions on Certain Foreign Purchases (JUN 2008) (E.O.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury). <i>[Check if the order is for either supplies or services and the amount exceeds the micro-purchase threshold, <u>unless</u> authorized by OFAC]</i>
	(41) – (44) [Reserved].
	(45) 52.232-33, Payment by Electronic Funds Transfer – Central Contractor Registration (OCT 2003) (31 U.S.C. 3332). <i>[Check if payment will be made by EFT and the contractor has registered in the CCR]</i>
√	(46) 52.232-34, Payment by Electronic Funds Transfer – Other than Central Contractor Registration (MAY 1999) (31 U.S.C. 3332). <i>[Check if payment will be made by either EFT or other means, e.g., check, and the contractor has <u>not</u> registered in the CCR]</i>
	(47) 52.232-36, Payment by Third Party (FEB 2010) (31 U.S.C. 3332). <i>[Check if payment will be made by a third party, e.g., purchase card]</i>
	(48) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a). <i>[Check if the order is for information technology which requires security of information technology, and/or is for the design, development, or operation of a system of records using commercial information technology services or support services]</i>
	(49)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx. 1241(b) and 10 U.S.C. 2631). <i>[Check if the order is for supplies that may involve ocean transportation: at least 50% of the gross tonnage must be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at rates that are fair and reasonable for U.S.-flag commercial vessels]</i>
	(ii) Alternate I (APR 2003) of 52.247-64. <i>[Check if 100% of the supplies will be transported on privately owned U.S.-flag commercial vessels]</i>

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial items, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial Items:

[Contracting officer check as appropriate.]

	Clause Number and Title (1) - (6) [Reserved]
	(7) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (MAR 2009) (Public Law 110-247)
	(8) 52.237-11, Accepting and Dispensing of \$1 Coin (SEP 2008) (31 U.S.C. 5112(p)(1)). <i>[Check if order is for services that involve business operations conducted in U.S. coin and currency, including vending machines]</i>

(d) *Comptroller General Examination of Record.* The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records -- Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e)(1) *[This paragraph applies only if award is made to a U.S. firm, except for item (vii) which applies to all orders.]* Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in paragraphs (i) through (xi) of this paragraph in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause –

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (APR 2010) (Pub L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note)).

(ii) 52.219-8, Utilization of Small Business Concerns (JAN 2011) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$650,000

(\$1,500,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

- (iii) [Reserved]
 - (iv) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246).
 - (v) 52.222-35, Equal Opportunity for Veterans (SEPT 2010) (38 U.S.C. 4212).
 - (vi) 52.222-36, Affirmative Action for Workers with Disabilities (OCT 2010) (29 U.S.C. 793).
 - (vii) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2010) (E.O. 13201).
 - (viii) [Reserved].
 - (ix) 52.222-50, Combating Trafficking in Persons (FEB 2009) (22 U.S.C. 7104(g)). Flow down required in accordance with paragraph (f) of FAR clause 52.222-50.
 - (x) – (xii) [Reserved].
 - (xiii) Promoting Excess Food Donation to Nonprofit Organizations (MAR 2009) (Public Law 110-247) Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.
 - (xiv) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx. 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64).
- (End of clause)

DEPARTMENT OF STATE ACQUISITION REGULATION (48 CFR Chapter 6) CLAUSES

NUMBER	TITLE	DATE
652.225-71	Section 8(a) of the Export Administration Act of 1979, As Amended (if order exceeds \$100,000)	AUG 1999
652.228-71	Workers Compensation Insurance (Defense Base Act) – Services (for services to be performed overseas when the contract includes covered contractor employees as defined in paragraph (a) of the clause) Fill-in for paragraph (c): “(c) The current rate under the Department of State contract is [<i>contracting officer insert rate</i>] of compensation for services.”	JUNE 2006
652.229-70	Excise Tax Exemption Statement for Contractors Within the United States (for supplies to be delivered to an overseas post)	JUL 1988
652.229-71	Personal Property Disposition at Posts Abroad	AUG 1999
652.237-72	Observance of Legal Holidays and Administrative Leave (for services where performance will be on-site in a Department of State facility)	APR 2004
652.239-71	Security Requirements for Unclassified Information Technology Resources (for orders that include information technology resources or services in which the contractor will have physical or electronic access to	SEP 2007

	Department information that directly supports the mission of the Department)	
652.242-70	Contracting Officer's Representative (if a COR will be named for the order) Fill-in for paragraph b: "The COR is _____"	AUG 1999
652.242-71	Notice of Shipments (for overseas shipment of supplies)	JUL 1988
652.242-73	Authorization and Performance	AUG 1999
652.243-70	Notices	AUG 1999

The following clause is provided in full text, and is applicable for orders for services that will require contractor employees to perform on-site at a DOS location and/or that require contractor employees to have access to DOS information systems:

652.204-70 Department of State Personal Identification Card Issuance Procedures (MAY 2011)

(a) The Contractor shall comply with the Department of State (DOS) Personal Identification Card Issuance Procedures for all employees performing under this contract who require frequent and continuing access to DOS facilities, or information systems. The Contractor shall insert this clause in all subcontracts when the subcontractor's employees will require frequent and continuing access to DOS facilities, or information systems.

(b) The DOS Personal Identification Card Issuance Procedures may be accessed at <http://www.state.gov/m/ds/rls/rpt/c21664.htm> .

(End of clause)