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CIN OF AGCL : U11101AS1962SGC001184
GSTIN : 18AABCA6977C1ZM

No:-MTL/PUR/213/2021-22//PT.VI/02

Date:-28/12/2021

Type of bid : LIMITED TENDER
Bidding type : Single Bid
Bid Closing On : 18/01/2022 at 2:00 PM Hrs. (IST)

ASSAM GAS COMPANY LIMITED invites quotation for supply of Automatic C.P. Transformer Rectifier with built in GPS based current interrupter as per detail specification and quantity given at Annexure - I with following terms & conditions.

Terms & Conditions for Limited Tender:

Submission of Bid :

1. The bidder should be an authorized dealer/ reseller for the quoted Brand. Documentary evidence must be submitted along with bid offer. The bidder must have previous experience of supplying similar item to govt. deptt. including Central/State PSUs. Copy of P.O. is to be enclosed with bid offer. The bidder should quote their rates including applicable GST, Freight charges for F.O.R. Duliajan, loading/unloading etc. in the following Format.

Item No./Mat.Code	Material Description	Unit	Basic Rate/Unit (INR)(A)	GST @%(B)	Freight (C)	Amount/ Unit INR (FOR Duliajan) (A)+(B)+(C)=D	Qty (E)	Total Amount (INR)(D) X (E)

2. The TOTAL AMOUNT shall be in figure as well as in words. No overwriting shall be allowed. In case of discrepancy, the rates quoted in words shall be considered to be correct.
3. Sealed envelope containing the bid duly filled in as per above Format on bidder's letter head should reach Chief Manager (Materials), Assam Gas Company Limited, Duliajan-

786602, Dist. Dibrugarh (Assam) on or before the bid closing date and time as mentioned above. If the bid closing date happens to be holiday/bandh call then the next working day will be considered as bid closing date. In case next working day is Saturday, the bid closing date shall be Monday.

4. The Sealed envelope containing the bid shall be marked at the top of the envelope with following details:-
 - a. AGCL Tender No.
 - b. Bid closing date.
 - c. Bidder's Name.
 - d. Brief description of supply.

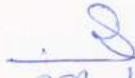
The bid received without mention of above on the envelope shall not be accepted and if by mistake tender envelope is opened, AGCL cannot be held responsible for cancellation of the bid and for quoted price being public.

5. Bid received vide E-Mail/Fax/Telegram/Telex/Cable/ bid in open condition will not be accepted
6. **EMD:** The bidder has to submit EMD for Rs. 20,000.00 (Rupees Twenty Thousand) only in the form of Bank Draft drawn in favor of Assam Gas Company Limited payable at Duliajan. The EMD will be released on completion of warranty period only. The EMD will be forfeited by the company in case party fails to comply with the terms of the contract. EMD submission shall be a criteria for bid evaluation. Bid offer without EMD shall not be accepted. EMD of unsuccessful bidder shall be released after issue of W.O. to the successful bidder.
7. **Validity:** The bid must be valid for 90 (Ninety) days from the date of opening of the bid.
8. **Delivery:** The delivery of ordered materials must be completed within 30 (Thirty) days from the date of receipt of the Purchase Order by Email. Delivery shall be a criteria for bid evaluation.
9. **Guarantee/Warranty:** Guarantee/Warranty shall stand as per manufacturer certificate. Warranty shall stand for 12 months from the date of installation and commissioning. If any defect found, during inspection & use the same should be replaced/repared free of cost by the vendor. Warranty issued in Bidder's Letter head shall not be accepted.
10. **Liquidated Damage:** The completion of delivery of the ordered item as mentioned above within the schedule date of completion of delivery shall be deemed to be the essence of the contract. In case of delay in delivery of the materials within the stipulated period, unless such delay is attributable to owner (AGCL) or due to Force Majeure, there will be reduction in contract value @ 0.5% (Point Five Percent) per week for undelivered quantities of materials for each week of delay or part thereof subject to maximum of 5% of the total contract value, as liquidated damage. The Liquidated Damage charge shall be recovered from the supplier's bill / invoice.

11. **Payment :** The company shall release 100% (Hundred Percent) payment to the supplier within 30 (thirty) days after receipt and acceptance of materials against submission of original invoice in triplicate along with all relevant documents as per P.O. and the NIT. Payment will be made through RTGS only. You are therefore, requested to provide the following bank details : a) Bank Name b) Branch Name c) Account Number d) IFSC Code. All statutory deductions as per Govt. of India's prevailing rule shall apply.
12. Conditional bids are liable to rejection at the sole discretion of the Company.
13. **Applicability of Law & Jurisdiction:** The Order shall be governed and interpreted in accordance with the applicable laws of India and Dibrugarh Courts in the State of Assam shall have exclusive jurisdiction
14. The Company reserves the right of rejecting any or all bids accepting any bid in part, without assigning any reason.

Thanking You,

Yours faithfully,


28/12/2021

For and on behalf of **MANAGING DIRECTOR**

Chief Manager (Materials) & HoD
Assam Gas Company Ltd.
Duliajan, Assam

ANNEXURE – I

Detail description of Item with quantity to be supplied:
Ref. NIT No. MTL/PUR/213/2021-22/PT.VI/02 dtd. 28/12/2021

Sl. No.	Item Code	Item Description	Qty	Unit
01.	03040173	Automatic C.P. Transformer Rectifier Unit Technical Specification at annexure – II Make – Kriston Systems or equivalent	02	Nos.

ANNEXURE – II

Technical specification of items to be supplied :

Ref. NIT NO. MTL/PUR/213/2021-22/PT.VI/02 dtd. 28/12/2021

**TECHNICAL SPECIFICATION FOR AUTOMATIC C.P.
TRANSFORMER RECTIFIER UNIT WITH BUILT-IN GPS
BASED CURRENT INTERRUPTER**

CONTENTS

- 1.0 GENERAL DESCRIPTION
- 2.0 TECHNICAL REQUIREMENT
- 3.0 TECHNICAL SPECIFICATIONS AND DATA SHEET FOR T/R UNIT
- 4.0 TESTING AND INSPECTION
- 5.0 GUARANTEE

1.0 GENERAL DESCRIPTION

This specification covers the requirements of design, manufacture, inspection, testing and supply of Automatic Controlled AC Operated Rectifier Unit for Cathodic Protection of underground structures. Reliability of equipment and ease of maintenance is of utmost importance. The workmanship shall be of highest grade and entire design and construction in accordance with the best modern practice. The CP TR Units shall be capable of continuous trouble free operation at full load rating specified. The protection devices and control components shall be of standard design and carefully chosen to meet the requirements of the sets.

All similar materials and parts of similar equipments shall be interchangeable with each other. Special care shall be exercised in the design and manufacture for aging effects, low input voltage, A.C. voltage fluctuations, high forward current through the rectifying elements and high temperature conditions during operation.

Apart from the derating for site conditions an additional derating of 20% shall be considered for the specific use. The components of the units shall be designed for maximum operating efficiency. The CP TR Units shall be provided with all the necessary protections required as detailed in the following pages. The CP TR Units shall have Automatic/Manual control and shall be metal clad, compact, indoor/outdoor installation type, air natural cooled, dust and vermin proof systems exactly conforming to the following specifications and the enclosed data sheet and no deviations shall be allowed.

2.0 TECHNICAL REQUIREMENT

- 2.1 The AC operated Rectifier Units' scheme for protection, monitoring, control, metering and indication shall be designed to meet requirements of this specifications. The control shall be achieved using thyristor and fully solid state logic only.
- 2.2 Transformer shall be of double wound, air cooled type with an electrostatic shield between the windings. The transformer insulation shall be Class F. The winding size shall be based on maximum current density of 1.6 Amps/sq. mm of copper conductor.
- 2.3 Rectifier shall be silicon type of approved make with adequate cooling arrangement and with moisture and humidity resistant finish. It shall be mounted on spindles or other suitable supports. It shall have configuration suitable for full wave rectification. Adequate filtering in the form of L-C filtering circuit shall be provided on output side to smoothen out the D.C. output to limit ripple content to less than 5% at rated output.

The input and output of rectifier shall be protected by fast acting fuses of suitable ratings. Transient surge suppressers shall also be provided across D.C. output terminals and AC

input terminals to protect the rectifier against surges. Each diode and SCR shall be provided with suitable surge suppressers.

2.4 The TR unit shall be provided with three modes of working as under. A mode selector switch shall be provided to select the desired mode of operation. All the modes shall be independent of each other and failure of the unit in one mode shall not affect working of the unit in other mode. A brief description of these modes is given below.

A) Auto Ref. Mode :

The unit will be generally working in this mode. The operation of the unit in this mode shall be controlled by a reference signal. The output D.C. voltage of the unit in this mode shall vary right from 0V to rated voltage and from 0A to rated current to maintain the reference signal within ± 15 mV of the set value under all operating conditions. The response of the unit shall be instantaneous to suppress extremely fast acting external stray currents, if present. The typical reference regulation in this mode shall be within ± 15 mV under all conditions.

Facility will be provided for Manual selection of any one out of the two reference inputs for control. Suitable metering arrangement shall also be provided to monitor both the external reference signals as well as the internal reference signals independently.

In the event of failure of the selected reference signal, the unit will provide alarm - "Reference Fail" and the output of the unit shall get adjusted to a preset value which will be operator adjustable from 0V to rated voltage.

Independent ultra fast acting electronic current limit circuit shall be provided to limit the output current of the unit in Auto mode to any value from 0 A to rated value as desired by the operator. The current limit circuit will be capable of protecting the unit even under dead short circuit across output. The unit will be capable of sustaining dead short circuit across output indefinitely without degrading or damaging any internal components in this mode.

B) Automatic Voltage-Current Control mode (AVCC mode)

This will be the second mode of operation. The working of this mode shall be totally independent of the Auto mode and failure of the unit in Auto mode shall not affect operation in this mode.

The output voltage of the unit shall be adjustable to any value from 0V to rated voltage by means of a stepless voltage setter. The set voltage shall be maintained within

$\pm 0.25V$ of the set value for change in DC input voltage within specified limits and change in load from 0A to full load.

The output current of the unit shall also be adjustable to any value from 0A to rated current by means of a stepless current setter. The current shall be regulated within $\pm 1.0A$ of the set value for change in AC input voltage within specified limits and change in load from zero to the rated value. The response of both current controller and voltage controller shall be ultra fast, instantaneous type.

The current limit circuit will be capable of protecting the unit even under dead short circuit across output. The unit will be capable of sustaining dead short circuit across output indefinitely without degrading or damaging any internal components in this mode.

C) Manual Mode

This will be the third mode of operation. The control of DC output in this mode shall be without any electronic component. A separate Autotransformer with 24 step controller will be provided to control the DC output voltage from 0 to rated voltage in 24 symmetrical steps

2.5 Reliability and Factor of Safety:

Due to very harsh conditions under which the units are going to operate, prime importance shall be given to ensure reliability and trouble-free operation. To take care of high transient voltages and high peak current demands adequate factor of safety shall be provided in choosing all the components. Minimum factor of safety to be provided for critical components are as under.

2.6 Working Life :

The Rectifier Unit shall be designed for a working life of minimum 20 years.

3.0 TECHNICAL SPECIFICATIONS AND DATA SHEET FOR T/R UNIT

A)	AC Input Voltage	:	180V to 270V, 1 Ph, 50 Hz, AC
B)	AC Input Current	:	22A (max)
C)	DC Power Output	:	2500W
D)	Transformer	:	Rating : 5.0 KVA (All the wound components in T/R unit will be of High Purity Electrolytic Grade Copper Conductor only)
E)	DC Output Voltage	:	0 to 50V
F)	DC Output Current	:	0 to 50A
G)	Factor of safety for Diodes/SCRs	:	Voltage - 300% factor of safety PIV - 1500V Minimum Current - 300% to 500% factor of safety
H)	Full load efficiency of rectifier	:	More than 80%
I)	Full Load Power Factor	:	Not Less than 0.8 lagging
J)	Insulation Level	:	2 KV for 1 minute
K)	Peak Inverse Voltage - Diode & SCR	:	1500V minimum
L)	Cable Entry	:	AC input, DC output, Reference Cells. From the bottom plate of the unit thru suitable cable glands.
M)	Filtering circuit	:	L.C. Filter
N)	Ripple & Hum at rated output	:	Less than 5% RMS
O)	Surge Diverters for Diodes / SCRs	:	Metal oxide varistors/R-C Networks
P)	Lightning Arrestor	:	At Input & output side of the TR unit RMS voltage rating : 500V Impulses discharge current rating : 5 KA.
Q)	Protection	:	2 pole MCB in AC input. 2 pole MCB in DC output. HRC fuses in AC input. HRC fuses in DC output. Glass cartridge fuses in the live line of all lamps, auxiliary power lines to control circuit. Ref. Fail indication and automatic setting of DC voltage to the preset value. Fast acting electronic overcurrent limits circuit & short circuit. Protection for output.

R)	Reference Electrode	:	2 Nos. Cu/CuSO₄ Facility shall be provided to select one out of three ref. Electrodes by means of a Manually operated Reference Selector switch.
S)	Control element	:	The DC output will be controlled using latest solid state SCRs. These SCRs will be controlled by the commands from the control circuits. All the electronic circuits will be assembled on plug-in type control cards.
T)	Modes of operation	:	Following modes of control shall be provided. a) Auto Ref. Mode: The operation of the unit in this mode will be fully Automatic and will be controlled by the Reference electrode feedback. The unit will automatically maintain Reference voltage or P.S.P. within $\pm 15\text{mV}$ of the set value under all conditions.
			b) AVCC Mode: This will be the second mode of operation. In this mode the unit can be operated in either constant voltage or constant current mode.
			In constant voltage mode the DC output voltage will be adjustable from 0 to rated value in stepless manner by means of a voltage setter potentiometer.
			In constant current mode the DC output current will be adjustable from 0 to rated value in stepless manner by means of a current setter potentiometer.
			c) Manual Mode: This will be third mode of operation. The DC output voltage of the TR unit in this mode will be controlled in 24 symmetrical steps by means of a separate Autotransformer with Coarse & Fine tapping.
U)	Ref. (P.S.P.) voltage setting range in Auto Ref. Mode	:	-0.8V to -2.5V
V)	Ref. Regulation in Auto Ref. Mode	:	Better than $\pm 15\text{mV}$

W)	DC Voltage setting range in AVCC Mode	:	0 to 50V															
X)	DC Voltage regulation in AVCC mode	:	Better than $\pm 0.25V$															
Y)	DC Current setting range in Auto Mode & AVCC Mode	:	0 to 50A															
Z)	DC Current regulation in current Limit mode	:	Better than $\pm 0.5A$															
AA)	Voltage Limit Setting in Auto & AVCC Mode	:	Facility will be provided for setting of voltage limit in 24 symmetrical steps in Auto & AVCC modes.															
AB)	Indications / Annunciations	:	<table border="0"> <tr><td>a)</td><td>Mains ON</td></tr> <tr><td>b)</td><td>Unit in Auto Ref. Mode</td></tr> <tr><td>c)</td><td>Unit in AVCC Mode</td></tr> <tr><td>d)</td><td>Underprotection</td></tr> <tr><td>e)</td><td>Overprotection</td></tr> <tr><td>f)</td><td>Reference Fail</td></tr> <tr><td>g)</td><td>Overcurrent (Current Limit Mode)</td></tr> </table>	a)	Mains ON	b)	Unit in Auto Ref. Mode	c)	Unit in AVCC Mode	d)	Underprotection	e)	Overprotection	f)	Reference Fail	g)	Overcurrent (Current Limit Mode)	
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AC)	Meters / Instruments	:	3-1/2 Digit Digital meter for the following <table border="0"> <tr><td>a)</td><td>AC Voltage</td><td>: 0 to 300V AC</td></tr> <tr><td>b)</td><td>AC Current</td><td>: 0 to 30A AC with C.T.</td></tr> <tr><td>c)</td><td>DC Voltage</td><td>: 0 to 60V DC</td></tr> <tr><td>d)</td><td>DC Current</td><td>: 0 to 60A DC with shunt</td></tr> <tr><td>e)</td><td>P.S.P.</td><td>: 0 to $\pm 19.99V$ DC</td></tr> </table>	a)	AC Voltage	: 0 to 300V AC	b)	AC Current	: 0 to 30A AC with C.T.	c)	DC Voltage	: 0 to 60V DC	d)	DC Current	: 0 to 60A DC with shunt	e)	P.S.P.	: 0 to $\pm 19.99V$ DC
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AD)	Current Interruption Facility	:	<p>Current interruption facility will be provided by means of a built-in contactor & microprocessor based synchronisable digital timer with real time clock & ON/OFF time display. The timer will have facility for adjusting the ON time & OFF time from 1 to 999 sec. by means of digital setting facility. Timer will have START, STOP facility thru local keypad or thru remote potential free contacts. The timer will have facility for Synchronisation to Master Timer or similar Timer in another unit.</p> <p>The Interrupter Timer will be provided with GPS Sync Facility.</p>															
			<p>Facility for interconnection of an external timer shall also be provided.</p> <p>A removable bypass link will be provided for bypassing the interrupter contactor contacts.</p>															

AE)	Enclosure/Construction	:	Floor mounted Outdoor Installation type. To be fabricated from 2.5mm CRCA sheet. Confirming to IP55 degree of protection. Lockable doors shall be provided in the front and back.
AF)	Cooling	:	Natural Air cooled.
AG)	Painting	:	Baked epoxy Powder coating of shade Light Grey as per 631 of IS 5 with proper pre-treatment as per the standard Industrial Practice.
AH)	Earthing	:	2 Nos. earthing bolts and 1 No. Nickel-plated copper earthing bus bar shall be provided.
AI)	Dimensions	:	L X B X H = 850mm X 700mm X 1550mm
AJ)	Weight	:	350Kgs. (Approx)
AK)	Environments	:	
	Max Ambient Temp	:	50 °C
	Relative Humidity	:	Upto 99%
AL)	Approved Make	:	Raychem / Kristron Systems / Equivalent Make

4.0 TESTING AND INSPECTION

The bidder shall provide all the necessary facilities to carry out full performance test on the CP rectifiers in the factory.

5.0 GUARANTEE

The manufacturer will have to guarantee the successful working of the units for a period of 12 months from date of installation & commissioning.