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## CENTRAL BOARD OF SECONDARY EDUCATION

(An Autonomous Organisation under the Union Ministry of Human Resource Development Govt. of India)

“SHIKSHA KENDRA”, 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110092

01.11.2011

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**Sub.: Limited tenders for S.I.T.C of AMF Panel for 200 KVA D.G. Set.**

Sir,

The CBSE intends to select experienced and reputed manufacture/ OEM with minimum 3yrs. experience and having satisfactorily executed minimum 02 works each of value Rs. 1.0 Lakh or more for SITC of AMF Panel for 200 KVA D.G. Set. Interested and Competent agencies may fill-up the prescribed formats and enclose an EMD amounting to Rs.3000/- in the form of DD/BD payable in favour of the Secretary, CBSE, Delhi. Agencies which are registered under Small Scale Industries shall be exempted from deposit of E.M.D. The last date for submission of the tenders is **16.11.2011 upto 2:00 p.m.** The tenders duly filled in are to be dropped in the tender box placed at Reception Hall, CBSE HQ Bldg., Preet Vihar, Delhi-110092. Incomplete and conditional tenders shall be summarily rejected. The Secretary, CBSE reserves the right to reject any or all the tenders without assigning any reason thereof.

Yours faithfully

(S.K. SHARMA)  
SR. ENGINEER (ESTATE)

## SCHEDULE OF WORK

S.NO.	DESCRIPTION	QTY.	MAKE	VALUE
1.	AMF RELAY	01	AE	
2.	AMP METER	01	AE	
3.	CHARGER (SMPS BASED 12/24 VOLT 10A)	01	AE	
4.	AC INDICATOR	03	VAISHNO	
5.	ROTARY SWITCH (16 AMP 2 WAY)	01	KC/VAISHNO	
6.	RELAY 4 POLE (50 AMP) 12/24 VOLTS	02	OEN/PLA	
7.	RELAY 8 POLE (10 AMP) 12/24 VOLTS	02	PLA	
8.	CONTACTOR 4 POLE 325 AMP	02	L&T/SCHNIDER/SIEMENS	
9.	FUSE 300 AMP & FUSE BASE 350/400 AMP	06	FTC/STANDARD	
10.	PUSH SWITCH	06	VAISHNO/SIEMENS/OMERON	
11.	MCB 1 POLE (20 AMP)	01	SCHNEIDER	
12.	CT 400/5 AMPS	03	AE	
13.	PANEL CABINET 16 SWG	01	CRCA STEEL	
14.	BUS BAR (ALUMINIUM) 40x10MM. PROPERLY INSULATED	AS REQ.		
15.	DC INDICATOR	02	SCI/FTC	
16.	CONTROL WIRING 1.5 MM <sup>2</sup>	AS REQ.	RAJDOOT/PHOENIX/FINOLEX	

**Gross Amount: Rs.....**

**Signed by:**

**Owner/ Manager of Firm**

## 1) SALIENT FEATURES OF AMF PANEL

### PROTECTION & SUPERVISION:

- Under & Over voltage protection for EB supply .
- Under & Over voltage protection for Gen supply .
- User programmable cranking attempts .
- Generator over speed supervision (frequency sense)
- External fault detection (LLOP,HCT ,V BELT)
- DG fail to start supervision and indication .
- DG fail to stop supervision and indication .

### MEASUREMENT & DISPLAY:

- EB voltage
- Generator voltage.
- Generator frequency.
- EB frequency
- Set value.

## 2) INDICATIONS

All measurements & warning will be displayed in plane language through LCD.

### TIMER:

- DG start
- DG stop
- Idle running.
- Crank gap.
- EB Restoration time.

## 3) FUNCTIONS

- The controller monitors the EB supply ,if EB supply varies beyond the set value ,the controller will give the start command to DG Set.
- To start the genset a controller gives a cranking via potential free contact, if the generator build up the voltage or oil pressure the controller will go in supervisory mode. If generator could not start after preset number of attempts it gives the message generator fail to start And ask for operator assistance.
- While running generator will monitor voltage ,frequency,LLOP,HCT,V-belt failure and in between it will keep on checking EB supply. After receiving the healthy EB supply it will stop the DG set and go in supervisory mode .

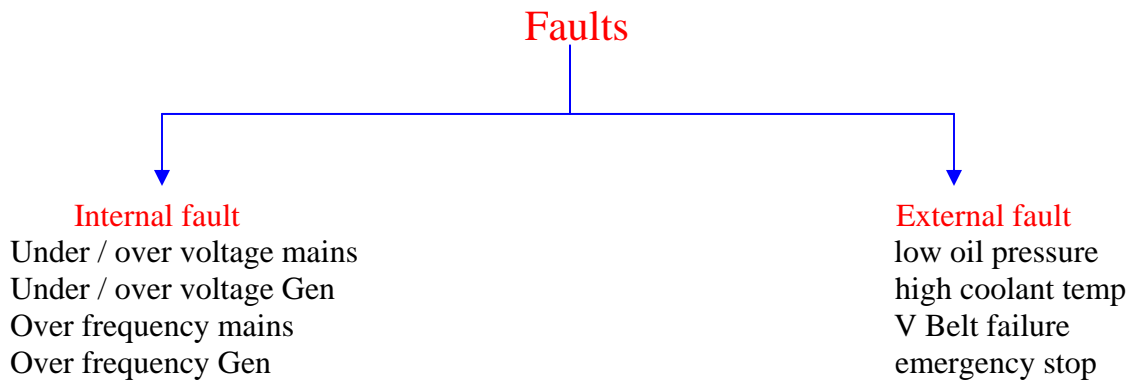
- When generator is in the supervisory mode and fault occur it will give the siren and switch off the contractor then stop the DG Set and persist fault will be indicated by LCD.
- Engine solenoid the controller can be configured either in energies to run mode or energies to stop mode.
- **Auto / manual mode**-The controller can be configured in Auto or manual de by connecting the negative terminal of battery appropriately.
- **Programming mode**- By pressing the menu and enter key simultaneously switch on the DC power supply ,the controller will go in programming mode .

The following parameters can be fed with the help of keys -

Sr. No.	DISPLAY	PARAMETER	EXPLANATION OF PARAMETER	FACTORY SETTING	SETTING RANGE
1	No Of Crank	No Of Crank	The max no of crank that set to start the generator	03	09
2	Crank time	Crank time	The max time for witch it will give start command	03second	Max 10sec
3	Mains under voltage	Mains under voltage	The permissible voltage under witch it will be treated as unhealthy and Gen Set will start.	180	180-270
4	Mains over voltage	Mains over voltage	The permissible voltage over witch it will be treated as unhealthy and Gen Set will start.	280	180-270
5	Gen under voltage	Gen under voltage	The permissible voltage under witch it will be treated as unhealthy and Gen Set will stop.	180	180-270
6	Gen over voltage	Gen over voltage	The permissible voltage over witch it will be treated as unhealthy and Gen Set will stop.	280	180-270
7	Over frequency mains	Over frequency mains	The permissible freq over witch it will be treated as unhealthy and Gen Set will start.	55Hz	0-99Hz
8	Over frequency Gen	Over frequency Gen	The permissible freq over witch it will be treated as unhealthy and Gen Set will stop.	55Hz	0-99Hz
9	Solenoid timing	Solenoid timing	The permissible time for the stop Solenoid to stop the Gen	30 second	0-99sec
10	Idle run	Idle run	The time for which generator will run for the cooling	10 sec	0-99sec

#### 4) Switch descriptions:

Sr. no	Switch symbol	description
1	Menu	
2	increment	Used to increment the value
3	Enter	Used to enter the value
4	Acknowledge	Used for acknowledge the message
5	Menu + Enter	Programming mode



## TECHNICAL PARAMETERS/ FEATURES OF AMF CONTROL PANEL:-

Control panel shall be cubical type made of 16 gauge CRCA sheet with hinged type openable covers mounted above base frame at suitable location of E/A set and supported on both sides on base frame. Rubber pads of 6mm. thickness shall be provided between the base frame and control panel supports. All the control panel wiring should be easily accessible and shall have sufficient working space for making connections of cables etc. A manual bypass switch shall be provided on the control panel for manual operation of the AMF system . However in manual mode all the safeties / tripping devices of E/A Set should remain functional.

### Functional Requirements :-

- All the functional requirements in Auto mode are to be achieved through microprocessor based AMF Controller. The logic for starting & stopping shall be :-
  - (i) If the mains fail, or one or more phase of mains is not available.
  - (ii) If any phase voltage of mains is out of preset limits however there should be a provision to set the limits of higher and lower phase voltages as per the site requirement. The mains supply within this range shall be considered as healthy so as to avoid continuous running of Engine Alternator Set.
  
- As the operating range of the power plant is from 90 V to 300 V (L-N) and that of AC Voltage stabilizer is quite wide, the AMF relay should be able to trigger E/A Set for starting and stopping in accordance with this range.
  
- Switch the load to the engine supply after suitable time delay, after starting the engine on mains failure/phase failure / low voltage / high voltage.
  
- Switch the load back to the mains supply after suitable time delay, when healthy mains supply is restored and stopping the Engine.
  
- Attempt to start the Engine up to three times on failure of earlier attempts with suitable time intervals.
  
- Two level fuel sensor for fuel should be provided at 50% & 25% respectively.
  
- System should provide following settable features :-
  - (a) Mains failure time - to initiate automatic EA start after 0 to 30 seconds of mains failure.
  - (b) Mains restore time - to initiate automatic stop of EA after 0 to 30 seconds of mains in stable conditions.
  
  - (c) Low oil pressure delay time - 0 to 3 seconds delay of the low pressure oil input alarm from engine start.
  - (d) Stop solenoid time - 10 to 30 seconds enabling time for "stop solenoid".
  - (e) Cranking up time - 0 to 3 seconds enabling time for starter. The timer is reset if the engine starts before the programmed time.

(f) Start attempts - 1 to 3 numbers of automatic attempts during automatic start cycle.

(g) Cooling down time - 0 to 10 seconds engine cooling time before stopping. During this time the engine runs without load.

(i) Generator voltage time - time of stable generator voltage to close EA contactor to load (0 to 10 seconds).

(i) 4 x 20 character back lit LCD on front fascia for showing various parameters of mains & DG viz. 3 ph voltage mains, 1 Ph voltage DG, LLOP, HWT

(ii) 6Nos. of 300A Fuse with 350A Fuse Base provide safety from over current

a) Contactors: - The rating of mains contactor shall be derived from KVA rating and the minimum voltage (90 V) which comes out 325 Amp 4Pole for 200 KVA DG Set for AC – 3 duty cycle. Rating of DG Contactor shall be derived from the KVA rating at 200 V which comes out 325 Amp for 200 KVA DG Set for AC – 3 duty cycle. For other EA Set ratings the same should be suitably enhanced. Both the contactors shall be electrically interlocked with contactor coil.

b) The supply to the coil of the mains contactor is to be provided with the help of a static voltage regulator having wide input range 12v/24v and output with in the operating range of contactor coil.

d) Microprocessor based Automatic Mains Failure Controller (suitable for 12V/24vDC),

The following alarms are to be made available in AMF Control panel / Controller through LEDs / LCD

a) Mains fail

b) LLOP

c) High cylinder / water temperature

d) Over speed

e) Under speed

f) Alternator fault

g) DG fail to start

h) DG fail to stop

i) Fuel low

k) Fuel very low (for stopping of engine)

l) DG fault (common for any DG fault)

m) Canopy temperature high

n) Low water level (for water cooled sets)

s) Over / Under voltage

### **Operational Requirement:-**

i. AC and DC wiring shall be separated distinctly.

ii. Connections of control wiring shall be done with connector strips and ferrules for identification on both ends.

iii. 1No. Multifunctional meter to indicate Voltage, Current, Frequency of mains & DG Set.

iv. Push button for stop, start, & change over

v. visual indication for LLOP, HCT / HWT, Over speed, Lack of fuel.

vii. RYB LED indication for indicating Mains / EA Set Supply

viii. DC Ammeter [0-30A], of size (min.92mmx92mm )

ix. Selector switch for Auto /Manual operation .

x. Battery Charger: Automatic trickle battery charger of SCR or SMPS type to charge the starting battery of DEA set. This charging shall be done through main supply for which a suitable incomer shall be provided in the panel with suitable range of ammeter and voltmeter on the DC side with protective fuses.

**SAFETY CONTROL TRIP**

- (i) Low lubricating oil pressure.
- (ii) High cylinder / water temp.
- (iii) Lack of fuel.
- (iv) Alternator Fault
- (v) Over speed



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**IMPORTANT TERMS & CONDITIONS**

1. Incomplete and conditional tenders shall be summarily rejected.
2. The rates quoted should be inclusive of all the Taxes whatsoever upto commissioning.
3. There should not be any cutting/ overwriting in the rates.
4. Complaints lodged shall have to be attended within 12 working hrs.
5. In case the complaint is not cleared within 12 working hrs., penalty @Rs.300/- per day shall be levied.
6. The cubicle should be of CRCA Sheet Steel of SAIL/TISCO.
7. The Painting must be of high quality with neat finish.
8. Satisfactory Work-Report must be submitted alongwith the bill.
9. The Defect liability period shall be one year from the date of Commissioning.
10. The agency shall be bound to use only genuine spares.
11. In case the complaint is not attended within 12 working hrs. for the 2<sup>nd</sup> time also, the agency shall be debarred for consideration in future.
12. For servicing of the AMF Panel if needed, the agency shall deploy skilled manpower with proper equipments. AMC shall be assigned on mutually agreed rates.
13. The Agency shall keep all the equipments in perfect working condition.
14. The agency must inspect the existing D.G. Set installation before submitting the tenders.
15. The AMF Panel shall be fabricated with all branded components. The agency shall give a useful life certificate for 10 years.
16. In case the Board is put to any financial loss directly or indirectly by any act of commission or omission on the part of the agency and any of its workers, the Board shall have the right to impose cash penalty as deemed fit or deduct such amount from its security deposit.
17. 10% amount of the value of work completed shall be deducted from the bill as Security Deposit which shall be retained for one year. The amount can be released against submission of a Bank Guarantee of equivalent amount in f/o the Secretary, CBSE.
18. The agencies registered as Small Scale Industry (SSI) shall be exempted from submitting EMD & shall be required to submit a copy of their Registration Certificate.

**Acceptance by the Tenderers:**

I hereby affirm that I have read all the terms and conditions before submission of the Price-Bid and are acceptable to me.

Office Telephone Nos. \_\_\_\_\_

(Signature of Tenderer)\_\_\_\_\_

Mobile No. of contact Persons \_\_\_\_\_

with complete and address and office

Place: Delhi

Date: