

MORMUGAO PORT TRUST
ENGINEERING MECHANICAL DEPARTMENT

NOTICE INVITING BUDGETORY OFFERS

Name of Work	NAME OF WORK "Design, Supply, Installation, Testing and Commissioning of AMF panel at Port Hospital"
Date of submission of budgetary quotation	On or Before 16 /02/2017 at 1500 Hrs.
Address for communication:	Executive Engineer(E-HL), Mechanical Engineering Department, Mormugao Port Trust, Electrical Section, 1st Floor, Admin. Building, Headland sada Vasco-de-Gama Goa - 403804
Contact Details	Phone : (0832) 2594241 Email : trevor.silveira@mptgoa.com
Website	www.mptgoa.com

CHIEF MECHANICAL ENGINEER
MORMUGAO PORT TRUST

1. SCOPE OF WORK:-

- 1.1 Disconnecting 5 nos cables, (4 nos 3.5C x 240 sq mm, 1 no 3.5C x 150sqmm and 4C x 25 sq mm 1 no) removal and shifting the existing panel to new location in the same room and connecting back the disconnected cables.
- 1.2 Disconnecting 6 nos of cables (size 3.5 X 240 sq mm) and dismantling existing AMF panel.
- 1.3 Design, Supply, Installation, Testing and Commissioning of new AMF panel after connecting 6 nos cables (size 3.5 X 240 sq mm) for 320 KVA Diesel generator.

2. Technical Specifications

The work involves Design, Supply, Installation, Testing and Commissioning of AMF Panel Indoor type, 630 Amps ACB EDO type.

The AMF panel shall be indoor type, floor mounted, dust and vermin proof in CRCA sheet steel construction with a thickness of not less than 2.5mm should be used for load bearing members and not less than 2.0 mm for non load bearing members as per the relevant standards. The panel shall have doors at the front and back for proper maintenance. The panel shall have steel channel fabricated kick-plate and bolted type cable gland plate fitted at the bottom. All the joints shall have provided with neoprene gaskets. The panel should have powder coating with a thickness of not less than 50 microns.

The Panel is to be manufactured at the supplier's works as per relevant IS codes and shall be CPRI approved. Panel to be installed at MPT site in the minimum down time. It should incorporate LED type phase indicators, KWH/KVAH/digital Energy Meter, Power Factor Meter, Ammeter, Voltmeter and Frequency meter, each with suitable rotary selector switches. It should be designed for Automatic and Manual mode functioning with suitable 'On Panel' controls. The Panel should incorporate a battery charging system for the DG set battery and should have provision for internal illumination.

General Features

When mains are healthy, the Mains ACB should be ON.

When Mains supply is unhealthy i.e. phase failures, under voltage, overvoltage, unbalance voltage and no voltage, the mains ACB Should trip. The DG should start automatically, develop the voltage and connect the DG Breaker to load.

Similarly, on resumption of power supply, the generator breaker is to be opened after 3 minutes, mains breaker is to be closed and then generator is to be switched off after 2-3 minutes (cool time) go on standby mode again.. The system must have **fail proof** electrical interlocking and if required, mechanical interlocking as well, to ensure that only one breaker is closed at any given time.

The system should be able to detect any single phasing or change in phase sequence in the main supply and in such a case, should switch over to generator supply. The system should also have provision for visual audio alarm indication and annunciation facility.

The complete schematic drawing should be submitted for approval of the Port, within 4 weeks of placement of order.

The entire unit should be pre-wired, pre-assembled and mock tested at Bidder's works. Installation at MPT site will have to be done in minimum time of not more than three or four days during which time alternate arrangements would have to be made by the Bidder to maintain power supply to the building. All components/switchgear to be supplied should be sourced from reputed manufacturers. Control relays/components should be DIN rail mounting type. All wiring should be properly ferruled and should terminate in duly numbered DIN rail mounted connector blocks.

All internal components shall be provided with suitable identification labels suitably engraved. Labels shall be fixed on buttons, indication lamps etc.

The period of installation of New AMF Panel should be kept to a bare minimum. All the arrangements required to maintain the Power supply to the affected areas during the period of execution of work, such as provision of standby generator, temporary cable of adequate size, changeover switch of adequate rating, etc should be arranged by the Bidder.

System Operation

1. Auto Mode

- a. A line voltage monitor shall monitor supply voltage on each phase. When the mains supply voltage fails completely or falls below set value (variable between 80 to 95% of the normal value) on any phase, the monitor module shall initiate start up of diesel engine. To avoid initiation due to momentary disturbance, a time delay adjustment between 0 to 5 second shall incorporated in startup initiation.
- b. A three attempt starting facility shall be provided 6 seconds ON, 5 seconds OFF, 6 seconds ON, 5 seconds OFF, 6 seconds ON. If at the end of the third attempt, the engine does not start, it shall be locked out of start and a master timer shall be provided for this function. Suitable adjustment timers are to be incorporated which will make it feasible to vary independently ON-OFF setting periods from 1-10 seconds. If alternator does not build up voltage after the first or second start as may be further starting attempt will not be made until the starting facility is reset.
- c. Once the alternator has built up voltage, the alternator circuit breaker shall close connecting the load to the alternator. The load is now supplied by the alternator.
- d. When the main supply is restored and is healthy as sensed by the line voltage monitor setting, both for under voltage and unbalance, the system shall be monitored by a suitable timer which can be set between 1 minute to 10 minute.
- e. The diesel alternator set reverts to standby for next operation as (a), (b) and (c) above.

2. Manual Mode

- a. In a manual mode, it shall be feasible to start-up the generator set by the operator on pressing the start push button.
- b. Three attempts starting facility shall be operative for the start-up functions.

- c. Alternator circuit breakers closing and trip operations shall also be through operator only by pressing the appropriate button on the panel and closure shall be feasible only after alternator has built up full voltage. If the load is already on 'mains', pressure on 'close' button shall be ineffective.
- d. Engine shut down, otherwise due to faults, shall be manual by pressing a 'stop' button.

3. Test Mode

- a. When under 'test' mode, pressing of 'test' button shall complete the start up sequence simulation and start the engine. The simulation will be that of mains failure.
- b. Engine shall build up voltage but the set shall not take load by closing of alternator circuit breaker. When the load is on the mains, monitoring of performance for voltage/frequency etc. shall be feasible without supply to load.
- c. It during test mode, the power supply has failed; the load shall automatically get transferred to alternator.
- d. Bringing the mode selector to auto position shall shut down the set as main supply is ON. If the main supply is not available at that time, the alternator shall take load.

Engine shut down and alternator protection equipments:-

Following shut down and protection system shall be integrated in the control panel:-

a) Engine:-

- i. Low lubrication oil pressure shut down. This shall be inoperative during start up and acceleration period.
- ii. High coolant (water) temperature shut down.
- iii. Engine over speed shut down.

b) Alternator protection:-

- i. Over load
- ii. Short circuit
- iii. Earth fault
- iv. Over voltage

Detailed specification of AMF Panel for 320KVA Diesel Generator Set:

A	Switch Gears
	<ul style="list-style-type: none"> • 2 nos. 630A, 4 pole, Electrical operated Drawout type ACB with Micrologic 2.0 and breaking capacity of 50KA with electronic microprocessor release for O/C & E/F and shunt trip under voltage facility for Mains and DG Supply with Mechanical Interlock. <p>Make: ABB-EMAX/Siemens 3WL/L&T-U-Power/Scheniders</p>
B	AMF Logic
	<ul style="list-style-type: none"> • One Main supply voltage monitor • One Alternator supply voltage monitor • Restoration timer • Impulse Automatic Engine Start/Stop Logic & Engine Fails to Start Alarm. • Mains and Generator Voltage, Current & Frequency monitoring. • One Set of control relays for the automatic control system. • Battery voltage sensing & monitoring • Engine protections for: LLOP, HWT, Over Speed, Full load, maximum load warning etc <p>Make: DEEPSEA/DIEF/COMAP</p>
C	Battery Charger
	<ul style="list-style-type: none"> • SMPS based Automatic float cum boost battery charger • One DC Ammeter • One DC Voltmeter • Selector Switch for Auto/Manual & float/Boost <p>Make: Dubas / Ruttonsha</p>
D	CTs for Metering Make: Newtek / AE / Indcoil
E	Metering
	<ul style="list-style-type: none"> • Digital Ammeter with selector switch • Digital Voltmeter with selector switch • Digital Frequency meter <p>Make: Rishabh / MECO / AE</p>
F	Metering
	<ul style="list-style-type: none"> • Digital KWH meter • Digital KW/ PF Meter <p>Make: Conzerv / Rishabh / AE</p>
G	Indications

	<ul style="list-style-type: none"> • DG ON • DG load ON • Mains ON • Mains load ON • Phase Indications <p>Make: Schneider / Teknik</p>
H	<p>MCBs/Fuses</p> <p>Make: Schneider / Legrand / Havells</p>
F	<p>Push Buttons (AMF Module Bypass Mode)</p>
	<ul style="list-style-type: none"> • Engine Start/Stop • Generator ACB Close/Trip • Mains ACB Close/Trip • Fault accept/Reset

PRICE SCHEDULE (BILL OF QUANTITIES)

NAME OF WORK: **Design, Supply, Installation, Testing and Commissioning of
AMF panel at Port Hospital”**

Sr. No.	Description	Qty	Unit	Rate / Unit in (Rs.)		Amount (Rs)
				In figure	In words	
1	Disconnecting 5nos of cables, removal & shifting of existing panel & connecting back the cables	1	no			
2	Design,Supply, Installation, Testing & Commissioning of AMF Panel as per technical specifications					
	a) Supply	1	no			
	b) Installation, testing and commissioning	1	no			
3	Disconnecting, removal and shifting of existing panel at MM division	1	No			

(Rupees _____ only)

Note: The rates shall be inclusive of all taxes and duties except service tax which will be paid extra as applicable. However, if new tax is imposed by Central/State Government, the same will be reimbursed on submission of documentary evidence.