



आईएसओ 9001-2015 पत्तन  
AN ISO 9001-2015 PORT

MORMUGAO PORT AUTHORITY  
**ENGINEERING MECHANICAL DEPARTMENT**  
**ELECTRICAL HARBOUR SECTION**

**NOTICE INVITING BUDGETORY OFFERS**

Name of Work	<b>“Supply, Installation, Testing &amp; Commissioning of Automatic mains failure (AMF) panel for 45 KVA generators at Gate no:1”</b>
Budgetary Quotation no:	<b>CME/XEN (E-HR)/ 24/H7/B1</b>
Date of submission of budgetary quotation	On or Before <b>06/08/2024 at 15:00 Hrs.</b>
Address for communication:	Executive Engineer (E-HR), 2nd floor, Mechanical Engineering Department, Mormugao Port Authority, Admin. Building, Headland sada Vasco-de-Gama Goa - 403804
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**EXECUTIVE ENGINEER (E-HR)**  
**MORMUGAO PORT AUTHORITY**

## TECHNICAL SPECIFICATION

### 1. **GENERAL:**

Mormugao Port Authority intends to provide Automatic Mains Failure (AMF) panel for 45 KVA generator installed at gate no 1.

### 2. **SCOPE OF WORK**

2.1. The work involves Supply, Installation, Testing and Commissioning of 1 no. AMF panel, complete along with necessary stand for mounting the panel.

#### 2.1.1. **General Features required in AMF panel**

In the event of incoming power failures or an unhealthy mains supply, the 45 KVA generator should start automatically. Once it reaches the required voltage, the connected load should be transferred to the 45 KVA generator.

Conversely, when the main power supply is restored and deemed healthy, the load should be switched back to the main supply, and the generator should automatically shut down

The AMF panel must be capable of detecting single phasing or changes in phase sequence in the main supply, and it should automatically switch to generator power in such cases. Additionally, the panel should include visual and audio alarm indicators, as well as annunciation capabilities.

#### 2.1.2. **Operation procedure for AMF panel (AUTO MODE)**

a. The controller shall continuously monitor the supply voltage on each phase. If the mains supply voltage fails completely or drops below a pre-set threshold (ranging from 80% to 95% of the normal value) on any phase, the monitor module shall trigger the start-up of the generator. To prevent activation from brief disturbances, a time delay adjustment of 0 to 5 seconds will be incorporated before initiating the start-up.

b. Once the generator alternator reaches the required voltage, the Automatic Transfer Switch (ATS) shall engage, connecting the load to the generator.

c. When the main supply is restored and confirmed as healthy, the controller shall operate the ATS to reconnect the load to the mains.

Simultaneously, the generator shall shut down and switch to standby mode for future use.

Note: In the event of a controller failure, manual operation should be possible. The panels should include a bypass feature to allow manual execution of all automatic functions if the controller fails.

### **2.1.3. Engine shut down and alternator protection equipment's:-**

Following shutdown and protection system shall be integrated in the control panel of ATS:-

#### **a) Engine:-**

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

#### **b) Alternator protection:-**

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

### **2.1.4. Detailed specification of AMF panel for 45KVA Diesel Generator Set:**

The AMF panel shall be fabricated with powder coated 16 swg. CRCA with internal wiring and mounting of all below listed items.

<b>A</b>	<b>Switch Gears</b>
	<ul style="list-style-type: none"><li>• 80 Amps MCCB –3 nos.</li><li>• 63 Amps Automatic Transfer switch with handle for manual operation</li></ul>
<b>B</b>	<b>Controller logic</b>

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	<ul style="list-style-type: none"> <li>• One Main supply voltage monitor</li> <li>• one Alternator supply voltage monitor</li> <li>• Restoration timer</li> <li>• Automatic Engine Start/Stop Logic &amp; Engine Fails to Start Alarm for generator.</li> <li>• Mains and Generators Voltage, Current &amp; Frequency monitoring.</li> <li>• Battery voltage sensing &amp; monitoring</li> <li>• Engine protections for: LLOP, HWT, Over Speed, Full load, maximum loadwarning etc.</li> </ul>
<b>C</b>	<b>1 no. of Battery Charger for charging 1 no. 12V DC battery.</b>
	<ul style="list-style-type: none"> <li>• SMPS based Automatic float cum boost battery charger</li> <li>• One DC Ammeter</li> <li>• One DC Voltmeter</li> <li>• Selector Switch for Auto/Manual &amp; float/Boost</li> </ul>
<b>D</b>	<b>CTs for Metering</b>
<b>E</b>	<b>Metering</b>
	<ul style="list-style-type: none"> <li>• Digital Ammeters with selector switch indicating load on DG</li> <li>• Digital Voltmeter with selector switch indicating voltages of DG</li> <li>• Digital Frequency meter indicating frequency of DG</li> </ul>
<b>F</b>	<b>Metering</b>
	<ul style="list-style-type: none"> <li>• Digital KWH meter</li> <li>• Digital KW Meter</li> </ul>
<b>G</b>	<b>Indications</b>
	<ul style="list-style-type: none"> <li>• DG ON</li> <li>• DG load ON</li> <li>• Mains Healthy</li> <li>• Phase Indications</li> </ul>
<b>H</b>	<b>MCBs/Fuses</b>
<b>F</b>	<b>Push Buttons (Bypass Mode)</b>
	<ul style="list-style-type: none"> <li>• Engine Start/Stop for both generator independently</li> <li>• Fault accept/Reset</li> </ul>

## 2.2. Supply, laying and terminating of power cables and control wiring:

2.2.1. The contractor shall supply 4 C X 70 sqmm cable of 1.1 KV voltage, grade aluminium armoured XLPE of length 100 meters.

2.2.2. The above cable shall be laid and terminated as below :

2.2.2.1 1 run from Main supply to AMF panel for providing main supply to the ATS switch.

2.2.2.2 1 run from Generator output to AMF panel.

2.2.2.3 1 run from output of AMF panel to Load.

2.2.3. The contractor shall supply and lay the control cable from the generator to the AMF panel, facilitating generator protection, battery charging, and sensor connectivity.

2.2.4. All the power and control cables shall be terminated using proper size glands and lugs.

**Note:** The cables shall be laid underground wherever required by excavating trench of 0.8 m depth and 0.4 m width.

## 2.3. Earth Pits and Earthing:

Supply and providing 6 nos GI pipe earthing (1 for AMF panel, 2 for generator neutral, 2 for generator body & 1 for shed) using 40 mm dia 2.9 mm thick, 2.5 meter long GI pipe with GI funnel with mesh and suitable size reducer fixed on the top of the earth electrode. The funnel should be enclosed in a CC chamber of 400 x 400 x 400 mm with a cast iron cover. The electrode shall have staggered holes of 12-mm dia., and the electrode should be covered 150 mm around with alternate layers of salt and charcoal from the bottom of the pipe to the bottom of the CC chamber the connection from the electrode is to be established through GI strips of 25x3 mm using GI bolts and nuts. Work includes supply & fixing of all the required material for earthing including GI flats for each earthing connection.

## 3.0 MINIMUM ELIGIBILITY CRITERIA

The Bidder shall have successfully completed one Similar Work during last 7 (Seven) years ending last day of month previous to the one in which quotations are invited.

**Note:** Similar works means "supply and installations of Diesel Generator/ AMF panels at Central Govt. / State Govt. / Port Sector / PSU or any reputed organization".

#### **4.0 SPECIAL TERMS AND CONDITIONS**

- i. The Contractor shall commence and complete the work as per the BOQ and technical specifications. The work is to be carried out as per the site conditions and in accordance to the relevant IS standards.
- ii. The Contractor shall complete the work in all respect to the satisfaction of the Engineer-In-Charge or his representative.
- iii. The work shall be carried out with utmost safety precaution with minimum possible disruption of power supply. The contractor has to ensure that, the cable are disconnected on both the sides before commencing work.
- iv. The contractor shall submit complete schematic drawing for approval of the Port, before commencing of the work.

#### **5.0 OTHER TERMS AND CONDITIONS**

- i. The firm is advised to visit the site and get acquainted regarding the nature of the work involved at site conditions before quoting the offer.
- ii. The firm should engage skilled service personnel with the relevant required tools and instruments for commissioning the same.
- iii. The Contractor personnel engaged in the work shall follow all safety, security and General Rules enforced by Mormugao Port Authority (MPA) and the firm will only be responsible for the same.
- iv. MPA will not be responsible for any loss or damage of the men / materials / tools / plants engaged by the firm during the work at site / transportation.
- v. No advance payment will be made.
- vi. Final payment will be made only after satisfactorily completion of the work.
- vii. Necessary entry passes shall be obtained by the firm at their own cost with the approval of Port Officials.
- viii. Necessary electrical power supply required for installations will be provided by MPA at free of cost at nearest possible point. However, the firm should make his own arrangements to take power supply from the nearest source of supply.

**BILL OF QUANTITIES**

Name of work: " Supply, Installation, Testing & Commissioning of AMF panel for 45 KVA DG set at Gate no:1 "

Sr. No.	Description	Qty	Unit	Rates per unit in Rs.	GST %	Amount (Rs)
A	B	C	D	E	F	G=E X C
1.	Supply, Installation, Testing & Commissioning of AMF panel with internal wiring, switchgears, controller and control cables as per technical specifications listed above					
	a) Supply	1	no			
	b) Installation, testing and commissioning	1	no			
2.	Supply of 4 C X 70 Sqmm ,1.1 KV voltage grade aluminium armoured XLPE cable	100	m			
	Laying of 4 C X 70 Sqmm cable	100	m			
3.	Supply of 6 C X 2.5 Sqmm flexible copper cable for control	20	m			
	Laying of 6 Core X 2.5 Sqmm copper cable for control	20	m			
4.	Excavation of trench in hard soil 0.8 meter deep and 0.4 meter width and Back filling of trench	60	r m			
5.	Termination of 4 C X 70 sqmm cable by supplying proper size gland and lugs	6	no			
6.	Termination of 6 Core X 2.5 Sqmm m cable by supplying proper size gland and lugs	2	no			
7.	Earthing as per technical specifications	6	no			
8.	Supply of GI strip size 25mm x 3 mm	100	r m			



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9.	Laying GI strip size 25mm x 3100 mm		r m			
	<b>Total</b>					

(In Words Rupees \_\_\_\_\_  
only, exclusive of GST) .

**Note: The quantity specified in BOQ is indicative, however, payment will be made as per actuals.**