

# TELANGANA STATE POWER GENERATION CORPORATION LIMITED



PROJECT: 5X800MW YADADRI TPS

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**TECHNICAL SPECIFICATION FOR  
LOCAL PUSH BUTTON STATION**

**DOCUMENT NO: EPD-TS-YAD-LPBS-001 REV 01**

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## **SPECIFICATION FOR LOCAL PUSH BUTTON STATION (NON-FLAMEPROOF)**

### **I. SITE DETAILS**

**Project:** 5X800MW YADADRI TPS

**Location:** Verlapalem Village

**Nearest Town:** Miryalaguda (30 Km)

**Nearest Railway station:** Damaracherla (7 Km)

**Nearest Airport:** Vijayawada (130 Km)

**Nearest Seaport:** Visakhapatnam

**State capital:** Hyderabad

### **II. CODES & STANDARDS**

1. All equipment and materials shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards (IS)/ IEC except where modified and/or supplemented by this specification.
2. Equipment and materials conforming to any other standard which ensures equal or better quality may be accepted. In such case, copies of the English version of the standard adopted shall be submitted along with the bid.
3. The electrical installation shall meet the requirements of Indian Electricity Rules as amended up to date and relevant IS Code of Practice. In addition, other rules and regulations applicable to the work shall be followed

### **III. SCOPE OF SUPPLY**

The Bidder's scope of supply includes the following:

1. Supply of local push button station as per approved datasheet, drawing and this specification.
2. Quantity of local push button station shall be as per BHEL Purchase order.

### **IV. SCOPE OF WORK**

1. Replacement/ Repair of local push button station or its components during the warranty period due to any defect is in scope of bidder.

### **V. TECHNICAL REQUIREMENT**

Local Push Button stations (L.P.B.S) will be used for controlling drives from local as required.

The L.P.B.S will be generally installed in a hot, humid, and tropical atmosphere, heavily polluted at places with fly ash and/or coal dust, and shall be suitable for outdoor service with degree of protection specified elsewhere in this specification.

All L.P.B.S shall be liberally sized so as to provide spacious layout of equipment and devices with sufficient working space in between.

Adequate space/terminals shall be kept in the L.P.B.S for installing ammeter/ additional equipment in future.

For continuous operation at specified ratings, temperature rise of the various components/equipment shall be limited to the permissible values stipulated in the relevant standards and/or this specification.

All equipment/components thereof shall be capable of withstanding the mechanical forces and thermal stresses of the system short circuit current without any damage or deterioration of material.

Design, material selection, and workmanship shall be such as to present a neat appearance outside and inside with no welds, rivets, screws, or bolt heads apparent from the exterior surface of the L.P.B.S. All instrument cut-outs, mounting studs, and support brackets shall be accurately located.

**Non-flame proof L.P.B.S shall be furnished in CRCA enclosure of dust and vermin-proof, weather-proof, gasketed construction, suitable for outdoor use without canopy, and conforming to degree of protection IP-55 or better. Thickness of CRCA enclosure shall be 1.6mm**

L.P.B.S shall be suitable for column/structure/wall mounting and shall be complete with push-buttons, terminal blocks, anodised aluminium inscription plate, two (2) nos. earthing terminals, removable gland plate along with **crimp type tinned copper lugs** and **double compression type glands for cable/conduit entry from top and bottom**. The earthing terminals shall be suitable for connection to one (1) no. 8 SWG G.I. wire.

All L.P.B.S shall have protective lid over push buttons in order to avoid accidental operation.

All components shall be so mounted that removal and replacement may be accomplished individually without interruption of services to others.

L.P.B.S shall be of the following basic type and equipped with:

Type-A: One (1) START push-button and one (1) STOP push-button.

Type-B: One (1) OPEN push-button, one (1) CLOSE push-button, and one (1) STOP push-button.

Type-C: Flame proof type as per IS-2148. one (1) START push-button and one (1) STOP push-button.

Type-F: Flame proof One (1) STOP Emergency PB.

Push-buttons shall meet the following requirements:

- a) START push-buttons shall be spring return to normal type.
- b) STOP push-buttons shall have mushroom head actuator with press-to-latch and key-to-release feature.

- c) START push buttons shall be GREEN, STOP push buttons shall be RED.
- d) All push-buttons shall have a minimum of two (2) Normally-Open and two (2) Normally-Closed electrically separate contacts, rated minimum 5A at operating voltage (240V AC)
- e) Wiring shall be done with 1100V grade fire resistance PVC insulated stranded copper conductor of not less than 2.5 Sq.mm cross section. Each wire shall be identified at both ends by ferrules with wire designation.
- f) Terminals shall have provision for connecting at least two (2) nos. 2.5sq.mm. Copper cable and shall be rated for carrying continuously minimum 10 A at 240V A.C. and 2 A at 220V D.C.
- g) All push buttons shall be oil tight, heavy duty, push to actuate type, with coloured button and inscription plate marked with its function.
- h) Push buttons shall be shrouded type except for emergency trip button, which shall be mushroom type for easy identification

#### **Name Plate**

- a) Each L.P.B.S shall be provided with a nameplate.
- b) The material of the nameplate shall be anodized aluminium, 3 mm thick, with white letters on black background.
- c) The nameplates shall be held by self-tapping screws.
- d) The size of nameplate shall be approx. 20 mm x 75 mm. The size of the nameplate shall suit the overall dimensions of LPB station.
- e) Nameplates for L.P.B.S shall be according to final device/designation list.
- f) Instruments and devices mounted on the face of the panels shall also be identified on the rear with the instrument or device number.
- g) All components used shall also be identified.

#### **Wiring**

- a) The L.P.B.S shall be fully wired up at the factory to ensure proper functioning of control, and protection schemes.
- b) All spare contacts shall be wired up to terminal blocks.
- c) Wiring shall be done with 1100V grade fire resistance PVC insulated stranded copper conductor of not less than 2.5 Sq.mm cross section for current control circuits and voltage circuits.
- d) Each wire shall be ferruled by plastic tube with indelible ink print at both end having terminal Block No., terminal numbers, destination number as per approved wiring drawing.
- e) All wire termination shall be made with insulated sleeve solderless crimping type tinned copper lugs. Wires shall not be tapped or spliced between terminals.
- f) Wiring shall be neatly bunched in groups by non-metallic cleats or bands. Each group shall be adequately supported along its run to prevent sagging or strain on the termination.

- g) Colour codes shall be used for wiring as per latest revision of IS: 375.

### **Terminal Block**

- a) Multi-way terminal blocks complete with necessary binding screws and washers for wire connections and marking strip for circuit identification shall be furnished for terminating the panel wiring and outgoing cables.
- b) Terminals shall be box-clamp type, 4 sq.mm. minimum. Terminals for C.T. secondary leads shall have provision of shorting and grounding.
- c) Not more than two wires shall be connected to one terminal. If necessary, a number of terminals shall be jumpered together to provide wiring points.
- d) Each terminal shall be identified with designation as per approved wiring drawing.
- e) At least 20% of the total number of active terminals shall be furnished as spare in each L.P.B.S
- f) The wiring and terminals shall be so arranged that individual wires of an external cable can be connected to consecutive terminals.
- g) The terminal blocks shall be located to allow easy access and also to suit floor openings for cable entry.
- h) The bottom of the terminal block shall be at least 50 mm above the incoming cable gland plate.

### **Cable Entry**

- a) L.P.B.S shall have provision for cable/ conduit entry from both top and bottom.
- b) Suitable cable gland-plates shall be provided.
- c) Removable gland plate shall be provided for cabling and to make entry dust-tight. Gaskets may be used, if required, in order to achieve IP-55 or better degree of protection.

### **Painting**

Exterior paint shade shall be Opaline green (shade 275 of IS-5) and mounting plate shall be glossy white. Painting thickness shall be minimum 80microns. Either 7-tank process or better to be followed for painting in order to ensure that minimum painting thickness is obtained and painting is not peeled off during peel-off test.

## **VI. DOCUMENTS TO BE SUBMITTED IN THE EVENT OF ORDER**

- 1) The following drawings and documents shall be submitted for approval during detail engineering stage.
  - a) Type test reports
  - b) Guaranteed technical parameters
  - c) Wiring circuit
  - d) Terminal details

- e) Operation manual
- f) Any other document as requested by BHEL.

## VII. TESTS

All the equipment supplied shall be of type tested quality.

Type test reports shall be submitted for review. Type test reports shall not be more than 5years old as on date of tender opening.

Items shall be subjected to the routine test in accordance with the relevant Indian Standards/ IEC. All equipment shall be completely assembled, wired and tested at the factory as per the relevant documents and standards of IS/IEC. Customer/BHEL/TPIA will witness the tests. BHEL reserves the right to waive off the inspection, if they feel so, based on the requirement.

### Routine Tests

All L.P.B.S shall be completely assembled, wired, adjusted and tested at the factory prior to shipment to ensure accuracy of wiring, correctness of scheme and proper functioning of all components.

The tests shall include wiring continuity tests, high voltage tests, interlock & sequential operation test, insulation measurement test both before and after high voltage test, and functional tests to ensure accuracy of wiring operation of the control/ protection schemes and individual equipment.

Detailed test report including procedure and drawing shall be furnished.

All components shall be tested in accordance with relevant IS standards.

Type test certificate of non-flame proof, whichever is applicable shall be furnished. Otherwise the equipment shall have to be type tested, free of charge, to prove the design.

## VIII. DOCUMENTS TO BE SUBMITTED IN THE OFFER

### **Technical Offer (Technical-Bid)**

- 1) Signed & stamped copy of entire specification
- 2) Deviations, if any, to be specifically mentioned in **Annexure-A**.
- 3) Detailed drawing offered against each line item along with catalogues & datasheets
- 4) Wiring drawing of local push button station.
- 5) Type Test reports
- 6) Spiraled booklet of documents in support of PQR. (one dedicated copy to be directly sent to CPBG-Engineering for forwarding to TSGENCO for approval).
- 7) Any other technical document, if required.

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**ANNEXURE-A**  
**(DEVIATION SHEET)**

Sl. No.	Clause	Page	Description	Bidder's Deviation	Price impact : Yes / NO

**ANNEXURE-B**  
**(PRICE FORMAT)**

SL.NO	MATERIAL CODE	DESCRIPTION	QTY	UOM	UNIT PRICE	TOTAL PRICE
10	EL7423400009	LPBS TYPE -A [START + EMG STOP]	243	EA		
20	EL7423404004	LPBS TYPE -E [EMG STOP]	1681	EA		
<b>TOTAL BASIC PRICE</b>						-