

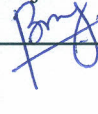
Bharat Heavy Electricals Limited
High Pressure Boiler Plant, Tiruchirappalli - 620 014.



Technical Specification of
E-stop Push Button Station

TDC:TCI:SCR:EPB:F

Project: BHUSAWAL TPS - (1X660 MW)

Rev.no.	Date	Description of events	Prepared	Reviewed	Approved
00	05-06-2021	Initial release	Balaji K 	Balaji K 	A K Panda 

The intended application of Flameproof Emergency-stop (E-stop) Push Button station is emergency shut-down of Ammonia unloading and injection process in Selective Catalytic Reduction (SCR) process for Nox reduction in thermal power plant.

The E-stop push button station shall be supplied along with warning alarm beacon lamp and warning alarm hooters (both flame proof) to warn the operators regarding ammonia leak or other dangerous operating conditions. All the components (E-stop push Button station, beacon lamp, hooter cable glands etc.) shall be selected to be fit for use in industrial applications with corrosive and dusty environment and shall be corrosion resistant to ammonia vapours in particular.

Emergency-stop push button station should be made from Cast Aluminium (LM6 grade), dust and vermin proof, suitable for outdoor use. Thickness of material shall be suitably selected considering the application and hazardous area classification. E-stop push button station, warning lamp and warning horn should be suitable for column/structure/wall mounting and shall be provided with all mounting accessories. The enclosure shall have an IP-65 (as per IS 60529) protection rating. Valid type test certificate for enclosure protection not earlier than 5 years from date of enquiry shall be submitted by vendor.

All the equipment shall be suitable for use in hazardous area classification NFPA 70 Class 1, Div. 1, Group D or Equivalent. Temperature rating shall be T4. Valid certification for E-stop PB station, warning lamp and warning horn, not less than 5 years from recognized agencies like CIMFR or ATEX or IECEx etc. shall be furnished for the same. All the equipment shall bear valid certification/approval from CCOE/PESO in addition. The flameproof test certificate for E-stop PB station shall be for an enclosure of similar dimensions. If valid type test certificate is not available with the vendor, type tests to be conducted at vendor's cost, without any commercial implication to purchaser.

The E-stop push button station shall be provided with SS-304 name plate and two numbers of earthing terminals.

E-stop push button shall have mushroom head (60mm head) which is very easy to operate in emergency conditions. The push button should be red colour and background mount in yellow colour. The push button shall be stay put, push-pull type (press to actuate and twist to release type) provided for emergency applications. Industrial-grade push buttons shall be provided. Push button shall have VDE, CE, UL, CSA or BIS approval with CM/L number.

E-stop push button shall have minimum 2 NO and 2 NC electrically separate contacts, rated 10A at operating voltage, prewired and terminated neatly in terminal blocks to facilitate further wiring to control system by customer.

All the wiring shall be done by 1100V grade, 1.5 Sq.mm PVC insulated stranded copper conductor (BIS approved with valid CM/L No.). Each wire shall be identified at both ends by ferrules with wire designation.

Terminals shall have provision for connecting at least 2 Nos. 2.5 Sq.mm Copper cables and shall be rated for carrying the current. Terminals for 24V DC supply shall be fused terminals.

Each E-stop push button station shall be supplied along with flame-proof warning beacon lamp and flame-proof warning horn (hooter). The warning alarm beacon lamp and warning alarm horn shall be suitable for hazard warning in industrial applications.

The warning beacon lamp should be LED beacon, red in colour, shall have shatter-resistant lens, heat resistant reflector and have maximum light distribution and viewing distance. The lamp shall be suitable for indoor and outdoor use with IP-65 protection. The voltage level of the beacon lamp shall be 24V DC. The lamp is proposed to be driven directly from control system (DCS) of customer. Vendor to indicate the power required to drive the lamp.

The warning alarm horn (hooter) should be vibrating, high decibel, low current type. The alarm horn should be suitable for outdoor use with durable corrosion resistant finish. The alarm horn shall be rated for IP 65 protection. The voltage level of the alarm horn shall be 24V DC. The alarm horn is proposed to be driven directly from control system (DCS) of customer. Vendor to indicate the power required to drive the horn.

The warning beacon lamp and warning horn shall be capable of operating independently of each other based on process conditions.

Additional terminals shall be provided in E-stop push button station to provide power supply to warning beacon lamp and warning horn. All the TB's for providing power supply to lamp and horn shall be fused TB's.

Exterior of the E-stop push button station shall be epoxy painted with RAL 7032 and interior shall be painted with Brilliant white. Paint thickness shall be 75 micron (outer) & 50 micron (inner).

Ammonia is reactive with galvanized surfaces. Hence any galvanized/zinc surfaces shall be covered with powder coated epoxy paint finish.

E-stop push button station should also have a Horn silence push button. Horn silence shall be a momentary push button with 1 NO and 1 NC electrically separate contacts. The contacts shall be prewired and terminated neatly in terminal blocks to facilitate further wiring to control system by customer. The colour of horn silence push button shall be green.

Flame proof cable glands and dummy plugs compatible to area of classification shall be provided by the vendor for the cable sizes and cable OD's indicated below. The number of entries shall be as indicated.

Cable Entries to E-stop Push Button Station – 4 Nos.

Entry no.	Type of Cable	Cable OD (in mm)*	Purpose of Cable
1	4 P X 0.5 Sq.mm Cu Signal	15.0	For push button feedback to DCS.
2	5C X 2.5 Sq.mm Cu Control	18.5	For warning lamp and horn power supply from DCS
3	3C X 2.5 Sq.mm Cu Control	16.0	Wiring from warning beacon lamp
4	3C X 2.5 Sq.mm Cu Control	16.0	Wiring from warning alarm horn

Cable Entry to Warning Beacon Lamp – 1 No.
3C X 2.5 Sq.mm Cu Control – Cable OD* -16.0 mm

Cable Entry to Warning Horn – 1 No.
 3C X 2.5 Sq.mm Cu Control – Cable OD* -16.0 mm
 *Cable OD's have a tolerance of +/-2 mm.

The major BoM per E-stop push button station shall be as follows.

Sl no.	Description	Make & Model	Quantity
1	Enclosure	OEM make	1 No.
2	E-stop push button, Mushroom head, Red Colour	Vendor to indicate	1 No.
3	Horn Silence Push Button, Momentary push button, Green	Vendor to indicate	1 No.
3	Warning Beacon Lamp Red, 24V DC, Flameproof	Vendor to indicate	1 No.
4	Warning Alarm Horn, 24V DC, Flame proof	Vendor to indicate	1 No.
5	Flame proof Brass Cable Glands	Vendor to indicate	As indicated in GA drawing.
6	Terminal Blocks	Vendor to indicate	As indicated in GA drawing

The dimensions, internal layout and mounting of components shall be decided by vendor. The push-button station shall be liberally sized for spacious layout and clean wiring for easy access during maintenance. Vendor to submit manufacturing drawings for customer approval after placement of PO.

Vendor to submit Vendor Quality Plan (VQP) for review and approval. Inspection for the final E-stop push button station will be conducted at vendor works by BHEL/Customer. All required facilities for proper inspection at vendor works shall be arranged by vendor.

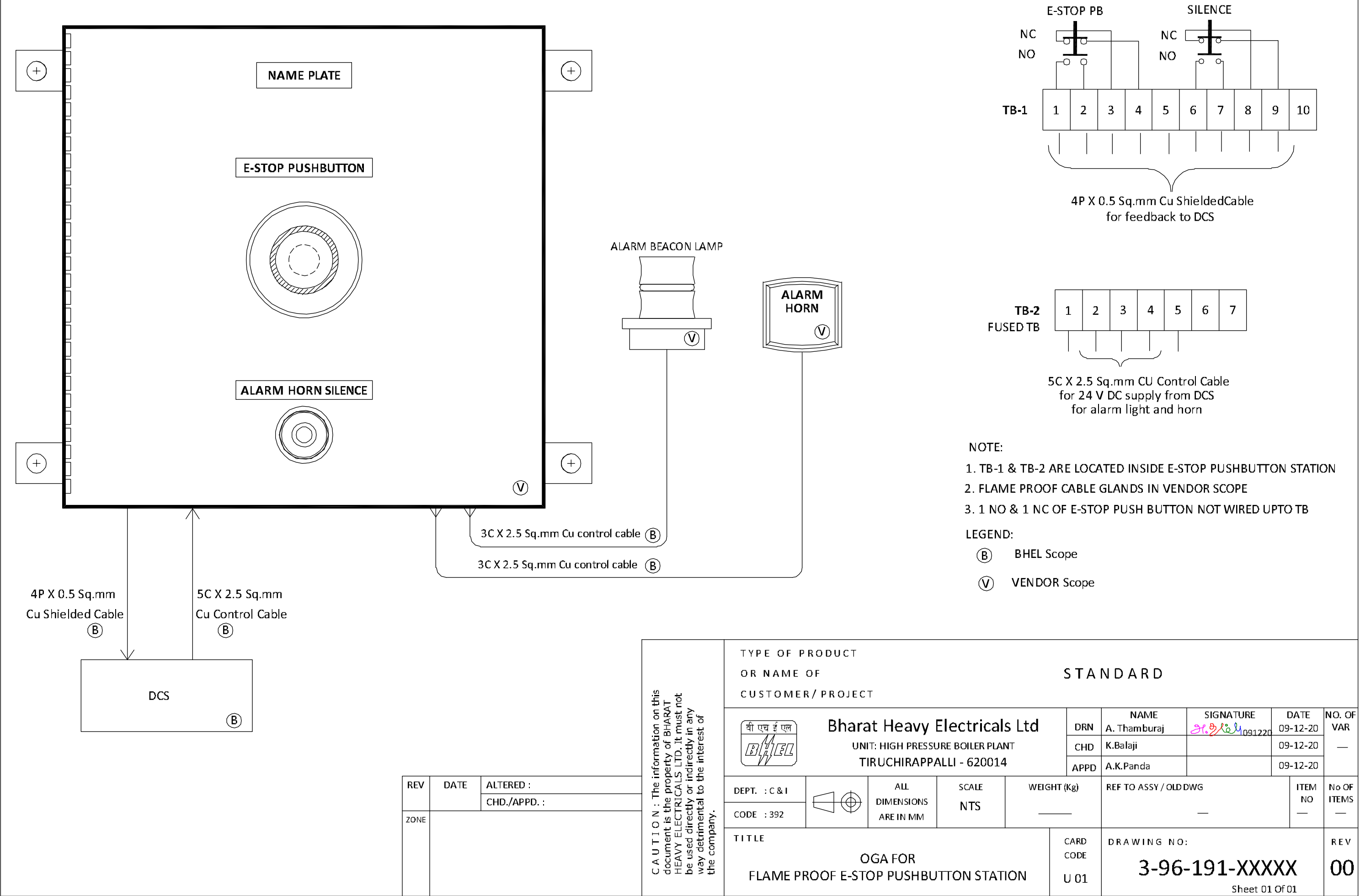
Vendor shall be fully liable for proper, sufficient and adequate packing, completeness of contents, protection of contents during storage time and correct preparation of the packing list. Packing and conservation of goods shall be sufficient to protect from damage during transit from point of manufacturer and storage at job site under conditions which may involve multiple handling, extended storage, exposure to moisture and the possibility of pilferage. Packing shall be sufficient to prevent rain water entry. For minimum packing instructions, the document QA:CI:STD:PR:02 Rev 03 attached along with this specification shall be referred.

Documents required along with the offer:

- 1) Filled in Sub-delivery enquiry deviation format indicating any deviation from the enquiry specification. If no deviations are there, the fully filled up, signed and stamped format shall be returned indicating "No deviation". Only deviations indicated explicitly in the format and accepted by BHEL in writing will be considered in the event of an order.

Documents required along with the offer:

- 1) Detailed manufacturing drawings indicating GA, internal layout.
- 2) Model number, catalogue and datasheet of E-stop push button, Alarm light and Alarm Horn.
- 3) Detailed Bill of Materials (BoM)

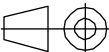


NOTE:
1. TB-1 & TB-2 ARE LOCATED INSIDE E-STOP PUSHBUTTON STATION
2. FLAME PROOF CABLE GLANDS IN VENDOR SCOPE
3. 1 NO & 1 NC OF E-STOP PUSH BUTTON NOT WIRED UPTO TB

LEGEND:
(B) BHEL Scope
(V) VENDOR Scope

REV	DATE	ALTERED :
		CHD./APPD. :
ZONE		

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TYPE OF PRODUCT									
OR NAME OF									
STANDARD									
CUSTOMER/ PROJECT									
		Bharat Heavy Electricals Ltd			DRN	NAME	SIGNATURE	DATE	NO. OF
		UNIT: HIGH PRESSURE BOILER PLANT			CHD	K.Balaji		09-12-20	VAR
		TIRUCHIRAPPALLI - 620014			APPD	A.K.Panda		09-12-20	—
DEPT. : C & I		ALL DIMENSIONS ARE IN MM	SCALE NTS	WEIGHT (Kg)	REF TO ASSY / OLD DWG			ITEM NO	No OF ITEMS
CODE : 392				—	—			—	—
TITLE					CARD CODE	DRAWING NO:			REV
OGA FOR					U 01	3-96-191-XXXXX			00
FLAME PROOF E-STOP PUSHBUTTON STATION						Sheet 01 Of 01			