

AARTECH SOLONICS LIMITED

A Brief Write-up On Control and Relay Panels

INTRODUCTION:

Multicircuit or single circuit Control and relay panels are the indoor control, indication, relay and metering panels for control of associated line or transformer through outdoor switchgear at various 33/11 KV sub stations. These control and relay panels are complete in themselves with all main and auxiliary relays, annunciation relay, fuses, links, switches, wiring, labels, terminal blocks, earthing terminals, base frame, foundation bolts, illumination, cable glands etc. These panels are available in Standard color finish of opaline Green from exterior and egg shell white from interior as per 275 of BS:381C (1948).

These multi or single circuit panels are available in various combinations, such as:

- 33KV transformer type schemes in a single panel
- 11KV transformer type schemes in a single panel
- 33KV feeder type schemes in a single panel
- 11KV feeder type schemes in a single panel
- 33KV one transformer & one feeder circuit in a single panel
- 11KV one transformer & one feeder circuit in a single panel
- 33KV two feeder circuits in a single panel
- 11KV two feeder circuits in a single panel

APPLICATION:

These panels are widely used in all electricity boards across India like MPEB, CSEB, KSEB etc.

TECHNICAL DESCRIPTION:

These panels are manufactured with 2-2.5mm of steel sheet with a standard dimensions of 1475mm (H) x 600(W) x 300(D). These panels are rated for 30V DC and 230V AC, 50Hz auxiliary supply.

TRANSFORMER/FEEDER PANEL:

33KV & 11 KV Transformer Control circuit in the Panel is required for control/protection on 33 & 11 KV side of 33/11 KV respectively. 33 & 11KV Feeder type control & relay panels is required for the protection of 33 & 11KV line respectively. This is generally in the form of a numerical relay which is the heart of the control and relay panels having O/C and E/F elements. Often these relays also have communication feature to download all the events to the PC.

The various components of these panels are described down here as follows:

SPA: A very important part of the control and relay panels is known as Single Point Annunciator (SPA). Single point annunciator (SPA) is used in 11KV & 33KV transformer and feeder protection control and relay panels to provide various indications and alarm for various type of faults as well as the healthiness of the circuit and the breaker status during operation. It is provided with no. of LEDs and pushbuttons to execute its operation. The various features of SPA have been described below.

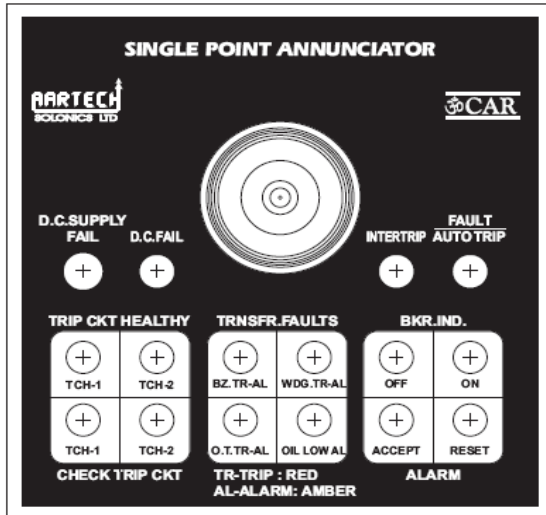
Rating: 30V DC, 230V AC

Dimensions: 144 (L) x 144 (W) x 70 (D). All dimensions are in mm.

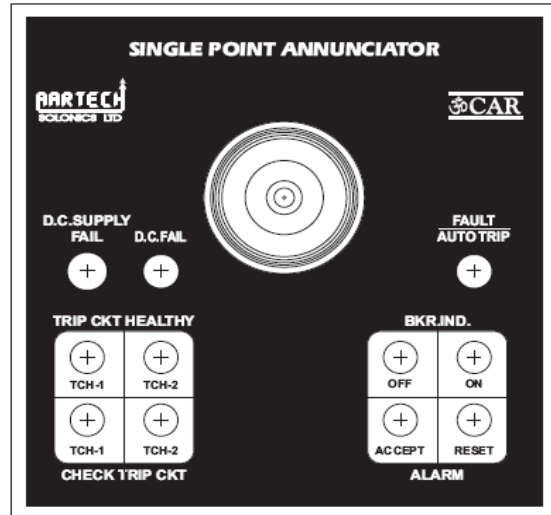
Features of SPA:

1. Trip Circuit Healthy-1(TCH-1) LED (white)
2. Trip Circuit Healthy-2(TCH-2) LED (white)
3. Breaker OFF LED (Green)
4. Breaker ON LED (Red)
5. Fault/Auto Trip LED (Red)
6. D.C. Fail LED (Red)
7. Buchholz Trip LED (Red) for 33KV transformer
8. Buchholz Alarm LED (Amber) for 33KV transformer
9. Winding Temperature Trip LED (Red) for 33KV transformer
10. Winding Temperature Alarm LED (Amber) for 33KV transformer
11. Oil Temperature High Trip LED (Red) for 33KV transformer
12. Oil Temperature High Alarm LED (Amber) for 33KV transformer
13. Oil Low Level Alarm LED (Amber) for 33KV transformer
14. Inter-trip LED (Red) for 11 & 33KV transformer
15. PB-1 Breaker Trip Coil-1 Push Button for TCH-1
16. PB-2 Breaker Trip Coil-2 Push Button for TCH-2
17. PB-3 Alarm Accept Push Button
18. PB-4 Alarm Reset Push Button
19. PB-5 DC Fail Test Push Button
20. The windows for Transformer faults shall have flashing indication.

Type A New



Type B New



SPA

METERING: For measuring the value of fault current and voltage of different phases, ammeter and voltmeter of digital or analog type as per customer requirement is installed in panels. The rating of these meters are as per 33kv or 11kv rating of panels. The standard dimension of these meters is SIF 96.

CONTROL AND PROTECTION:

1. 30VDC supply is provided for control and protection separately through various control fuses & Neutral links.
2. Manual Control: Breaker Control Switch (BCS) with trip neutral close position is provided for manual breaker operations of VCB in Remote position of L/R switch in VCB. Manual trip command is issued to 52T2 trip coil through VCB NO contact. Manual close command is issued to 52X close coil through VCB NC contact.

PROTECTION & TRIPPING: For protection & tripping, apart from the numerical Over current & Earth fault relay, master trip relays are also utilized as per the customer requirements. Tripping for all the protection is provided by actuation of Single pole Master trip relay with Hand Reset Contacts. Separate contacts are used for tripping of individual trip coils.