

THYRISTOR PANEL FOR T/R SET



Designer & Manufacturer of TR Set, Thyristor Control Panel, TR Controller for ESP and Micro-Processor based Control System and Software Developer.

SHYAMRAI ELECTRONICS, KOLKATA



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124 SARAT GHOSH GARDEN ROAD
"TRIBHUMI" Gr. FLOOR
CALCUTTA : 700 031
Ph. 033 2405 3236
FAX: 033 2415 7127
E-mail : shyamrai@vsnl.com

Technical specification

1. INPUT SUPPLY VOLTAGE : 415 Volt AC ? 10%
2. FREQUENCY : 50Hz ? 2 Hz.
3. PHASE : 2 Phase
4. MAX. INPUT CURRENT : ----- Amps
5. OUTPUT VOLTAGE : ----- Kv Peak
6. OUTPUT CURRENT : ----- Ma
7. AMBIENT : +50⁰C
8. HUMIDITY : 100%
9. INDICATION :
 - I) AC Volt Meter for Primary voltage indication
 - ii) AC Ammeter for Primary current indication
 - iii) mA Meter for Field DC current
 - iv) kV Meter for Field DC voltage
 - v) Red Lamp for Mains on Indication
 - vi) Green Lamp for TR on Indication
 - vii) Amber Lamp for Trip Indication
 - viii) Amber Lamp for Warning Indication
10. SWITCHES :
 - a) Mains Switch Fuse Unit.
 - b) Local / Remote Selector Switch
 - c) Lockable Push button for Emergency Stop
 - d) Ack. Push Button Switch.
11. CASTLE LOCK : Provision for Castle interlock switch.
12. CONTROL : Micro-Processor based controller (ESPC3)



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Principle of operation of TR Panel Unit

When the Main Switch Fuse Unit is closed, 415 Volt AC is fed to the two step down transformers (TR1 & TR2). The step down voltage of 24 volt from TR1 is given to the control unit, and simultaneously a step down voltage of 230 volts from TR2 is given to the auxiliary units. ESPC3 control the switching on/off of the contactor. Other interlocks are provided in the contactor circuit to trip the same in case of abnormality.

If the controller gives the on command the relay RL1 is energized and hence the contactor is also energized via contacts of the same relay. As a result contacts points K1/1 and K1/2 of the main contactor are closed. This results in applied 415 volt AC across the two Thyristors, which are connected back to back.

Thyristors are protected by Snubber circuit (series RC circuit).

Two nos. of current transformer (CT) are provided for sensing the primary current for the controller, ammeter and thermal overload relay. More precisely the CT (Rated Amps :1) connected to the controller. The other CT (Rated Amps : 5) is connected to the ammeter and thermal overload relay in series.

To display the primary voltage at the controller, a feed back is given to the controller using a potential transformer (500:5).

The various potential free feed backs from TR unit and some from the control panels are given to the controller. This gives a summary and present status report to the controller which enables it to trip in case of any malfunction.

The relay RL2 is used for indication of warning at the local and remote panel.

The relay RL3 is used for indication of tripping at the local and remote panel.

The relays RL4 , RL5 & RL6 are connected to energized the Rapping Motors connected to the corresponding field.

A Hooter is provided to give an audio annunciation for the summation of warning and trip by using a relay RL7. A push button is also provided to accept the annunciation.

RL8 to RL11 is provided for TR Temp high trip, TR temp. high warn., TR oil level Low Trip & TR oil level low Warning.

Two nos. of analog meter is provided to display the field kV and field Current (mA) respectively..



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BILL OF MATERIALS

Sl. No.	ITEM	RATINGS	MAKE	QTY.
1.	Switch Fuse Unit Amps	SE-MG	1
2.	Contactor (AC1)	L&T	1
3.	Control Fuses + Base	2 Amps	GE	6
4.	Emergency Stop Push Lockable Button	4 Amps	RAAs	1
5.	Push Button	4 Amps	RAAS	1
6.	Selector Switch	4 Amps	KAYCEE	1
7.	Ammeter	0 – 5 Amps Scale 0 to Amps	AE	1
8.	Volt Meter	0 to 500 Volts	AE	1
9.	KV Meter	0-500?A (0 – 100kV)	Yetazu	1
10.	MA Meter	0-1.25V (0-)	Yetazu	1
11.	Indicating Lamps	230 V AC LED Type	EMCO Cluster	4
12.	CT	Rated Amps : 1 Amps	Kappa	1
13.	CT	Rated Amps: 5 Amps	Kappa	1
14.	Aux. Relay	3C/O, 4 Amps 24VAC	PLA	7
15.	Aux. Relay	2C/O, 4 Amps 240VAC	PLA	4
16.	O/L Relay	3-5 Amps	L&T	1
17.	Terminals	2.5 Sq. mm	Connect Well	1 Lot
18.	Step Down Transformer	415 – 230 V (1KVA)	Reputed	1
19.	Step Down Transformer	415 – 24 V (3 Amps)	Reputed	1
20.	Step Down Transformer	240 – 8 V (1 Amps)	Reputed	1
21.	Step Down Transformer (PT)	500 – 5 V (0.25 Amps)	Reputed	1
22.	Thyristors	1600 PIV Rated Amps	Semikron	2
23.	Resistances	100 ? 40W	Reputed	2
24.	Capacitor	0.22?FD 2000V	Reputed	2
25.	Capacitor	0.1?FD 600V	Philips	3
26.	GDT	200VOLT	Reputed	2
27.	Thermostat	95 °C	Reputed	2
28.	Control Wire	1.5 Sq. mm.	Havels	4 Coil
29.	Lgs, Ferrules, Term. Nos. Nameplates	-	Reputed	1 Lot
30.	Buzzer	10 volt AC	Reputed	1



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HOW TO REACH US :

For ,

- ? Reliability
- ? Quality
- ? Technical Support,

Please send all your correspondence to :

By Mail : **SHYAMRAI ELECTRONICS**
"TRIBHUMI", Gr. Floor
124 Sarat Ghosh Garden Road
DHAKURIA
CALCUTTA : 700 031

By Fax : **033 - 2415 7127**

By Phone : **033 - 2405 3236**
By Mobile: **09433007127**

By E-mail : shyamrai@vsnl.com or sales@shyamrai.co.in

Web Site : www.shyamrai.co.in