INTEGRA ENGINEERING

TM Type Railway Signalling Relays (Metal to Metal) for Interlocking

Main Features

- The TM type INTEGRA Relays has been designed to meet the basic conditions of Railway Signalling Safety Requirements as mentioned below :
  - ⇨ Any one front contact closed proves all back contacts open
  - ⇨ Any one back contact closed proves all front contacts open
  - ⇨ TM Type safety relays have been designed to fulfill the recommended requirements of IRS S-46, IRS : S-34 and IRS: S-23 as applicable.
  - ⇨ All front and back contacts of the relay are Metal to Metal.
  - ⇨ All the fixed contacts of our relays are twin contacts which enhance further safety level thus reduce the probability of contact failure to one thousandth of a comparable single contact.
  - ⇨ Plug-in type Relays
  - ⇨ Various contact configuration of Relays (i.e. 5F/3B, 6F/2B, 4F/4B etc.)

INTEGRA Engineering India Ltd
Regd. Office : P.O.Box. 55, Chandrapura Village , Taluka : Halol, Dist. : Panchmahals (India)
Tel : +91-2676-221870, +91-90999 18471 Fax : +91 2676-220887
Work: Halol-Champaner Road, P.O. Chandrapura, Tal. Halol, Dist. Panchmahals-391 520(India)
E-Mail ID : info@integraengineering.in

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Types of Relays

- ⇨ Neutral Line Relay 60V DC-Non AC Immunised (N 60V DC)
- ⇨ Neutral Line Relay 24V DC-Non AC Immunised (N 24V DC)
- ⇨ Neutral Line Relay 60V DC-AC Immunised (N 60V DC ACI)
- ⇨ Mechanically Interlocked Relay 60V DC (I/L 60V DC)
- ⇨ Mechanically Interlocked Relay 24V DC (I/L 24V DC)
- ⇨ AC Lamp Proving Relay for '110 V LED Signal' with interposing current Transformer (UNIVERSAL LED-ECR)
- ⇨ AC Lamp Proving Relay for 'ON' aspect with interposing current Transformer (ECR-'ON')
- ⇨ AC Lamp Proving Relay for 'OFF' aspect with interposing current transformer (ECR-'OFF')
- ⇨ AC Lamp Proving Relay for Route Indicator with interposing current transformer (TUECR)
- ⇨ AC Lamp Proving Relay for Shunt Signal (ECR-'Shunt')
- ⇨ Key Lock Relay Unit 60V DC-Non AC Immunised (KLCR-60V DC)
- ⇨ Key Lock Relay Unit 60V DC-AC Immunised (KLCR-60V DC-ACI)
- ⇨ Key Lock Relay Unit 24V DC-Non AC Immunised (KLCR-24V DC)

Special Relays

- ⇨ WKR2 Relay
- ⇨ N/R Relay for Point Contactor Unit

Various TM Type Relays and Characteristics :

Characteristics	Types of Relays											
	N 60V DC	N 24V DC	N 60V DC (ACI)	I/L 60V DC	I/L 24V DC	LED ECR	ECR-'ON'	ECR-'OFF'	TUECR	ECR-'SHUNT'	WKR2	N/R
Relay Ratings	60VDC ± 20%	24VDC ± 20%	60VDC ± 20%	60VDC ± 20%	24VDC ± 20%	Suitability with 110V AC LED signal	Suitability with 110V AC/12V AC signal Lamp	Suitability with 110V AC/12V AC signal Lamp	Suitability with five lamps of 110V, 25 W connected in parallel.	Suitability with shunt signal lamps 2 nos. of 50V, 25 W connected in series or 110V/25W connected in Parallel	Suitability for working in a point detection circuit and relay is rated for continuous current of 250mA.	Suitability for working in a Point Contactor Unit 24V DC
Coil Resistance	1550 Ω ± 10% at 20° C.C	390 Ω ± 10% at 20° C.C	1720 Ω ± 10% at 20° C.C	1070 Ω ± 10% at 20° C.C	190 Ω ± 10% at 20° C.C	48 Ω ± 10% at 20° C.C	20.8 Ω ± 10% at 20° C.C	20.8 Ω ± 10% at 20° C.C	20.8 Ω ± 10% at 20° C.C	4.34 Ω ± 10% at 20° C.C	44 Ω ± 10% at 20° C.C	COIL A : 75 Ω ± 10% at 20° C.C COIL B : 620 Ω ± 10% at 20° C.C
Pick Up Value	≤ 48V DC	≤ 19.5 V DC	≤ 48V DC	≤ 48V DC	≤ 19.5 V DC	≤ 90 mA AC	≤ 180 mA AC	≤ 180 mA AC	≤ 950 mA AC	≤ 390 mA AC	≤ 10V DC	≤ 15V DC (A COIL)
Drop off Value	≥ 12V DC	≥ 4.8V DC	≥ 12V DC	N.A.	N.A.	≥ 60 mA AC	≥ 110 mA AC	50 to 80 mA AC	500 to 600 mA AC	≥ 90 mA AC	≥ 2V DC	≥ 5V DC (COIL A & B connected in series)
Contact Pressure	As per IRS S:46 - Per contact element in single contacts, contact pressure shall be ≥ 15 grams. Per contact point in double contacts, contact Pressure shall be min. 10 grams											
	As per INTEGRA- Twin contact together contact pressure shall be ≥ 20 grams											
Contact Rating	As per IRS S:46 - 3 Amp continuously and 5 Amp for 30 seconds											
	As per INTEGRA 6 Amp continuously											

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INSTALLATION PRACTICE

⇨ Fixing of contact Springs

- The external 0.6 mm wires are terminated on the relay plug-in-base first by soldering them to the Contact Spring, which are in turn inserted in the plug-in-base as explained below. Fig. 1 illustrates the sequence of different steps.
- Fig.1 shows the contact spring with the two guiding rails and soldering hole. Solder the wire on to soldering hole of the contact spring as shown.
- Now keep the relay plug-in-base such a way that the numbers on the relay plug-in-base are straight. Insert the soldered contact spring in such a way that the two guiding rails of the contact spring are on the right side. The contact spring will initially go in freely. Push the contact spring further till you hear a click sound. The contact spring is now fully inserted and locked.

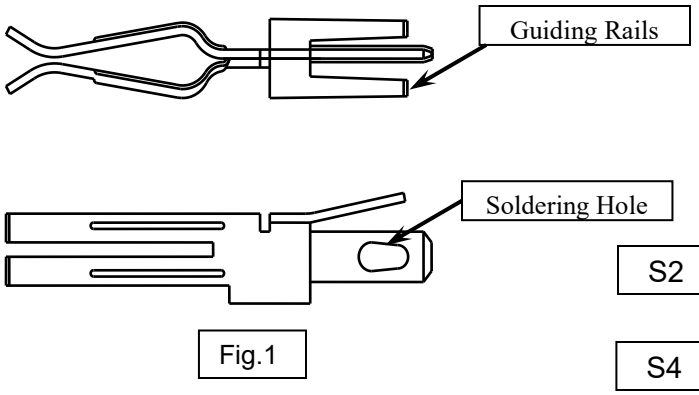

Fig.1

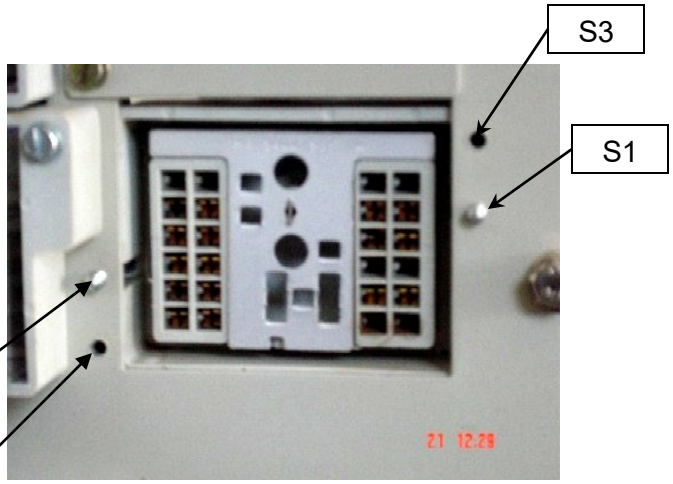

Fig.2—Front view of Plug-in Base

⇨ Mounting of the 'relay plug-in-base' on to Base Plate

- Fig.3 gives the suggested mounting arrangement. With use of screw S1 & S2 (ref. Fig.2), plug-in-base is first fixed on to the Base plate. The plug-in-relay is then plugged into the relay plug-in-base (Ref. Fig.4), after the relay is completely plugged in the screws S3 & S4(ref. Fig.2) are tightened on the Base plate.

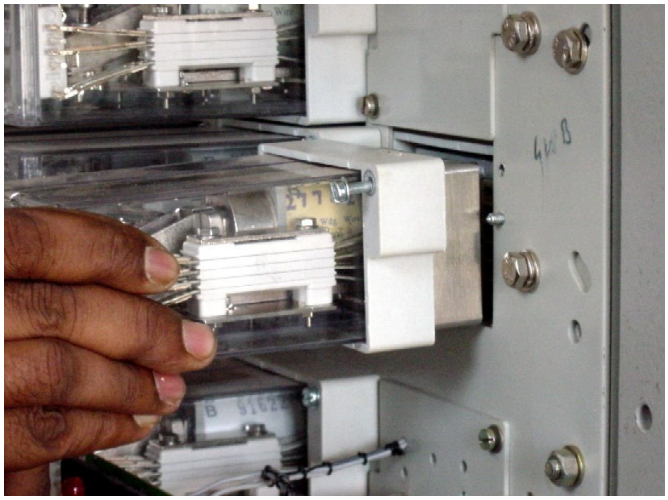

Fig. 3

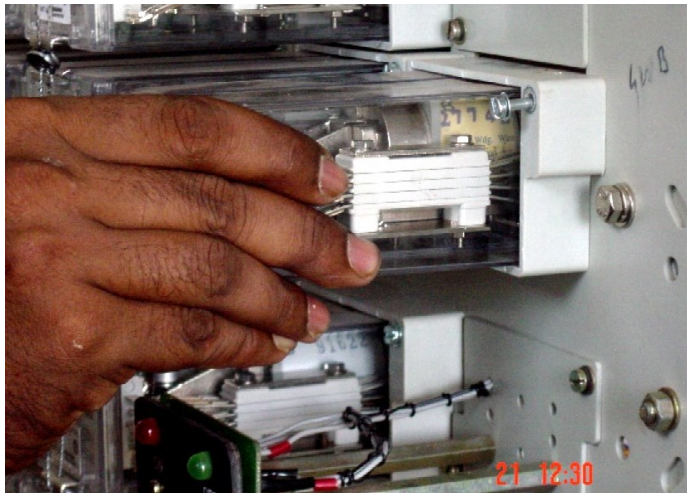

Fig. 4

⇨ Removal of Contact Spring

INSTALLATION PRACTICE

- In case the inserted contact spring to which the 0.6 mm wire is soldered needs to be removed from the relay plug-in-base the following procedure is to be adopted.
- Remove the 'Plug-in-relay' from the 'Plug-in-base' by unscrewing screws S3 & S4 (ref. Fig.2). The coding plate of the plug-in-base should be facing your side in the form of a 'T'.
- The contact springs are to be removed by using an extracting tool, as shown in Fig.5, this tool has two prongs and an stud.
- Insert the two prongs on the left side of the cavity and in such a way that the stud is on your right side (Fig. No.4) Push in the extraction tool completely till the stud goes in the cavity, which releases the contact spring. (Fig.5)

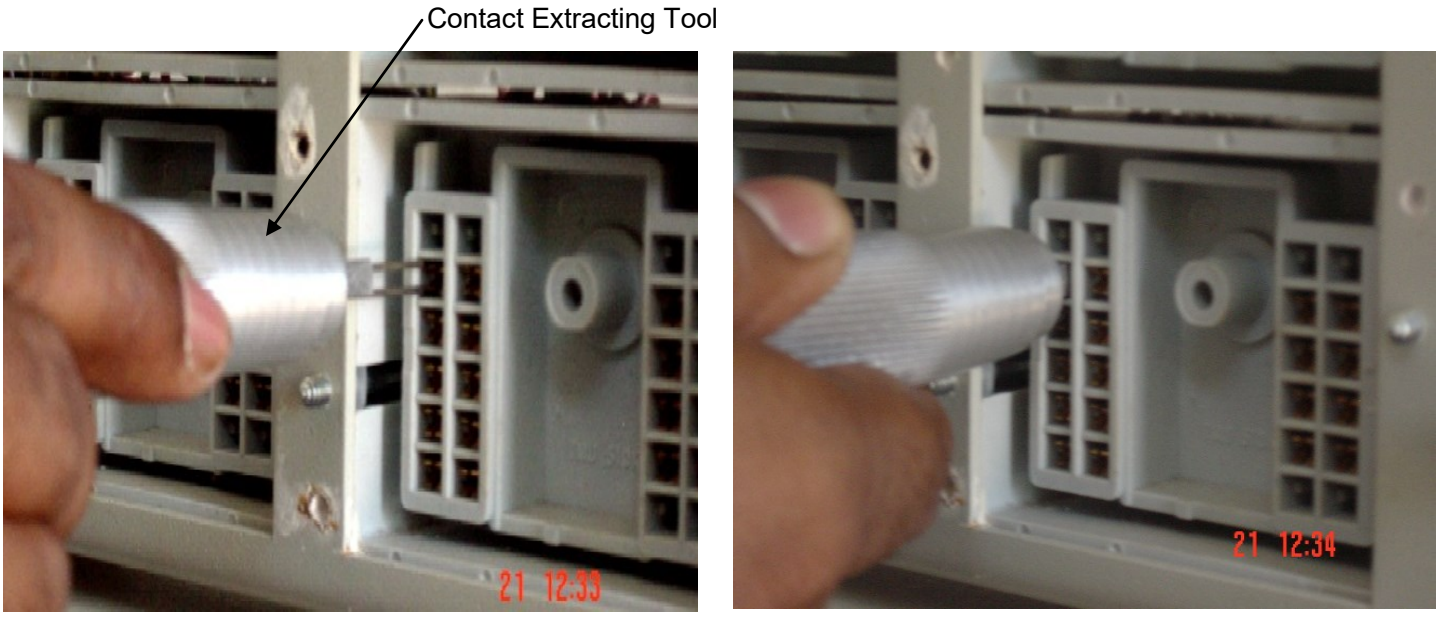

Fig.5

⇨ The contact spring can now be pulled out from behind (ref. Fig.6). The wires can now be de-soldered. The contact spring then to be put back.

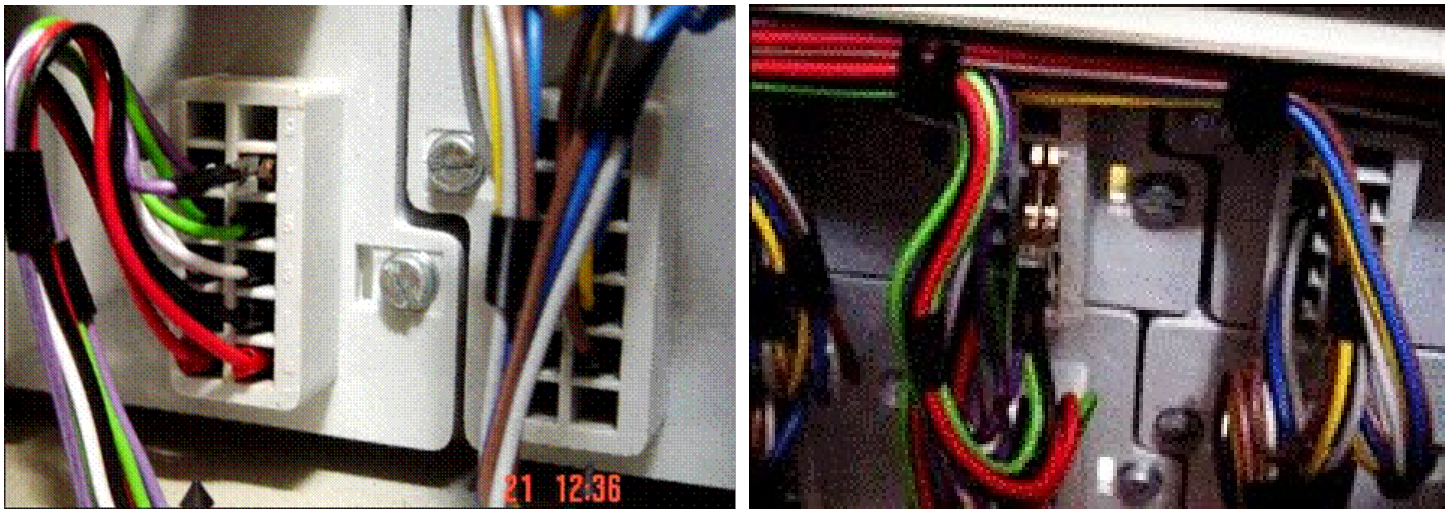

Fig.6

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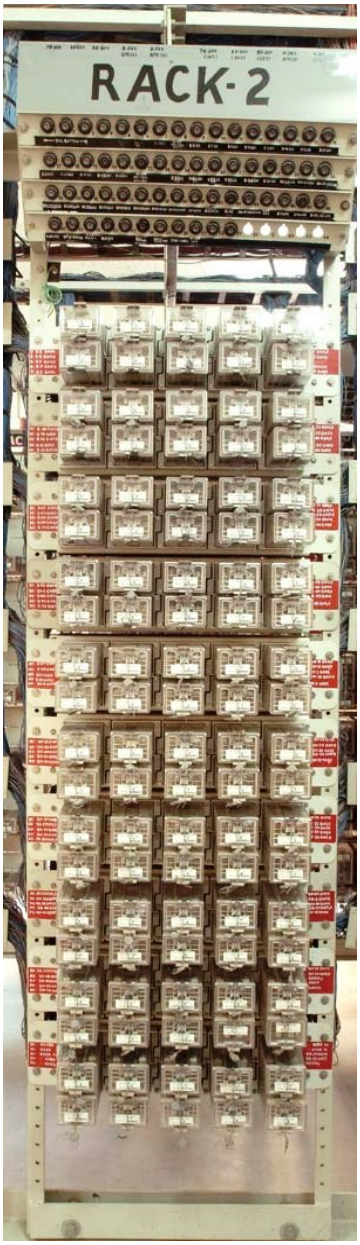
PRE-WIRED GROUPS



General Specification :

- Each Type of Group is a logical circuits combination of various Relays plugged in Pre-wired Base Plate of different size.
- All Relays used in Pre-wired Groups are approved by RDSO (Research Development Standards Organization)

Advantages of INTEGRA Make Pre-wired Groups :

- In case of any failure noted in relay where group need not required to be replaced, that relay needs to be replaced
- Restoration of system is quick after fault localization.
- Cost effective due to reduced inventory of spares.

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PRE-WIRED GROUPS

Type of Pre-wired Groups

- ⇨ 2 Aspect LED Signal Group (2ASP)
- ⇨ 3 Aspect LED Signal Group (3ASP)
- ⇨ 4 Aspect LED Signal Group (4ASP)
- ⇨ Shunt LED Signal Group (SSG)
- ⇨ Route Group (RT)
- ⇨ Point Group for Panel Interlocking [PG-(PI)]
- ⇨ Point Group for Route Relay Interlocking [PG-(RRI)]
- ⇨ Point Chain Group (PCG)
- ⇨ Point Contactor Unit (PCU)
- ⇨ Auto Signal Block Proving& Release Group (ASB)

Details of Relays used in pre-wired groups

Type of Group	Pre-wire Base Plate	Type of Relays used in pre-wired group							
		N 60V DC	N 24V DC	N 60V DC (ACI)	I/L 60V DC	I/L 24V DC	LED ECR	WKR2	N/R
2ASP	15 Pos.	8					2		
3ASP	15 Pos.	10					3		
4ASP	20 Pos.	10		2			4		
SSG	15 Pos.	9					4		
RT	15 Pos.	5			3				
PG (PI)	15 Pos.	1	3	1	2			1	
PG (RRI)	20 Pos.	4	3	1	4			1	
PCG	10 Pos.	5							
ASB	10 Pos.	5			1				
PCU	10 Pos.		1			1			1

Legend : Type of Relay used → 0 ← Denotes qty. to be used for each group

References :

- ⇨ **We have supplied more than 10 Million Relays to Indian Railways till 2018.**
  - Supply of relays for all 52 stations of newly built Konkan Railway including design of circuits.
  - Supply of relays for 4 stations of Mundra Port line & 14 stations of Veraval-Rajkot section of Western Railway.
  - Supply of relays for 40 stations of Central Railway and 20 stations of busy Delhi Mumbai route of Western Railway.
  - Supply of relays for 31 stations of Surendranagar-Bhavnagar section of Western Railway providing connectivity between newly developed Pipavav port and Indian Railways.
- ⇨ **INTEGRA has executed various Route Relay Interlocking (RRI) Projects directly and through contractors as depicted below :**
- ⇨ RRI project executed directly
  - Valsad RRI
  - Katarsinghwala RRI
  - New Azadpur RRI
  - Okhla RRI
  - Dayabasti RRI
- ⇨ RRI Projects executed through Contractors
  - Itarsi RRI
  - Nishantpur RRI
  - Gandhidham RRI
  - Badarpur RRI
  - Visakhapatnam RRI
  - Surat RRI
  - Gandhidham RRI
  - Viramgham RRI
  - Vizianagaram RRI
  - Visakhapatnam RRI
  - Cuttack RRI
  - Sambalpur RRI
  - Miraj RRI
  - Rewari RRI
  - Badarpur RRI

  Many More……..
- ⇨ **INTEGRA has executed various Panel Interlocking (PI) Projects directly like Kosikalan, Mangal Mahudi, Bhairongarh, Miyagam Karjan and through contractors more then 400 stn..**

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