



Order Number

Serial Number

## PRODUCT/TEST MANUAL

**2P540K1**

**PHASE FAIL RELAY**

<b>Issue Level</b>	<b>Date</b>	<b>Summary of changes</b>
A	02/11/2001	Initial issue.
B	21/11/2001	Pick volts para 3.2 & 4.1 changed to < 103 V
C	25/11/2003	6 b) amended to 110V.
D	14/10/2005	Test points corrected
E	26/05/2008	TfA 61549 Issue E

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ERL	DG	DG	



**1. DESCRIPTION OF OPERATION**

The 2P540 is designed to provide an alarm if any of the incoming voltage supplies are lost or an under voltage condition exists. The relay will remain in the dropped out condition until the faulted phase returns to normal or the Undervoltage condition is removed.

**2. SPECIFICATIONS**

Auxiliary Supply            110V AC 50 Hz  
 Undervoltage                80% of nominal (factory set)  
 Phase imbalance            5 - 15 % of nominal

**3. TEST EQUIPMENT REQUIRED**

Three Phase adjustable Supply  
 Digital Multimeter

**4. ASSOCIATED DRAWINGS**

690-204-210    Circuit diagram  
 690-204-310    Loading diagram  
 TfA 61549 Issue E 18/04/08

**5. HIGH VOLTAGE TESTING**

- a)    Apply 2kV 50Hz test for 1 minute between terminal Groups A and B.
- b)    Apply 1kV 50Hz test for 1 minute between contact terminals 18 & 19. Apply 1kV 50Hz test for 1 minute between contact terminals 3 & 4.
- c)    Apply three 5kV 1/50 impulses of each polarity between terminal Groups A and B.

Group A	Group B
6,7,9	2-4, 17-19 & frame
2-4	17-19,6,7,9 & frame
17-19	2-4,6,7,9 & frame

**6. CALIBRATION & TEST PROCEDURE**

- a)    Connect the DVM between TP6 and TP 1 with range set to 100 V.
- b)    Apply 110V 3 Phase to the relay as per the connection label. The output relay should pick up.
- c)    Adjust Balance trimpot (R3) for a minimum reading between TP6 & TP1

                     Checked

- d)    Connect the DVM between TP5 and TP1 with range set to 20 V. Decrease yellow phase so that the BLUE-YELLOW line voltage is 95 % (104.5) of the normal line voltage. Adjust trimpot R8 while monitoring TP5, so that TP5 gives a maximum reading.

                     Checked



**6. CALIBRATION & TEST PROCEDURE (Cont).**

- e) Set the three-phase supply to the nominal line voltage. Decrease all three phases slowly to 88V. Adjust trimpot R14 until the relay just drops out. Slowly increase voltage until the relay picks up. The pick up voltage should be less than 108 volts return all phases to normal line voltage.

	Nominal	Actual
Drop out	86-90 volts	
Pick up	< 108 volts	

- f) Set the phase imbalance potentiometer to 15 % (fully anticlockwise). Decrease yellow phase so that the BLUE-YELLOW line voltage is 93.5 volts. Adjust R21 until the relay drops out. Increase voltage and check that the relay picks up < 103 volts.

	Nominal	Actual
Drop out	93.5 volts	
Pick up	< 103 volts	

- g) Set the phase imbalance potentiometer to 5 % (fully clockwise). Decrease yellow phase so that the BLUE-YELLOW line voltage is 104.5 volts. Adjust R23 until the relay drops out. Increase voltage and check that the relay picks up less than 108 volts.

	Nominal	Actual
Drop out	104.5 volts	
Pick up	< 108 volts	

- h) Check that the operation time is less than 2.2 seconds and greater than 1 second, when one phase is restored to nominal levels.

**7. GENERAL & FUNCTIONAL**

Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903-000-026.

PASS

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

8. CONNECTION DIAGRAM

