

PRODUCT/TEST MANUAL

1B220K4

SINGLE SHOT AUTO-RECLOSE

Order Number

Serial Number

Issue	Date	Summary of changes
A	25/11/02	Initial issue.

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1. BROAD DESCRIPTION

The 1B220 relays are single shot adjustable automatic reclosing relays designed to initiate an automatic reclosing attempt of a circuit breaker following interruption of supply due to a fault in the system.

The auto-reclose function is shunt initiated. The dead time between initiation of the 1B220 and the output of the reclose signal may be selected between 0.5 and 10 seconds.

At the end of the set time period a two second reclose pulse commences after which a 5 to 100 second lockout timer is enabled. If at the end of the lockout period the circuit breaker has not re-opened the 1B220 will reset to provide another reclose sequence on the next fault.

The timing and logic functions are achieved using solid-state circuitry driving electromechanical relays. Initiation of the relay is achieved by applying a voltage (shunt initiate) to a single wound relay (start relay). This relay operates and remains operated via its own contact until the auxiliary supply voltage is removed by the protection.

The instantaneous protection may be inhibited by a switch on the front panel.

2. SPECIFICATIONS

Initiate relay

Shunt initiate	Voltage	125 Vdc
	Tolerance	+ 15% to - 25%
	Pulse length	> 40 mS

Auxiliary supply 125 Volts DC

Stand by Burden Zero

CB Auxiliary contact Requirement 1 Normally closed (when tripped), voltage free contact

Time ranges

Reclose	0.5 to 10 seconds
Lockout	5 to 100 seconds

Timing Accuracy +/- 2 % of setting
+/- 5 % of maximum setting

Inhibit Instantaneous protection Selectable

Instantaneous /Time delayed lockout Switch selection

Operation indicators LED "reclose"
LED "lockout"

SPECIFICATIONS (Cont.)

Output Contact Ratings

Lockout Contacts

Make and Carry Continuously

1700 VA AC resistive with maxima of 380 Volt and 8 Amp

1700 VA DC resistive with maxima of 250 Volt and 8 Amp

AC Break Capacity

1700 VA AC resistive with maxima of 380 Volt and 8 Amp

Alarm Contact

Make and Carry Continuously

3000 VA AC resistive with maxima of 660 Volt and 12 Amp

3000 VA DC resistive with maxima of 660 Volt and 12 Amp

Make and Carry of 0.5 Second

7500 VA AC resistive with maxima of 660 Volt and 30 Amp

7500 VA DC resistive with maxima of 660 Volt and 30 amp

AC Break Capacity

3000 VA AC resistive with maxima of 660 Volt and 12 Amp

3. TEST EQUIPMENT REQUIRED

DC Supply AC Current Supply AC Ammeter Electronic timer
Oscilloscope High Voltage Test Equipment. Dummy CB or similar

4. ASSOCIATED DRAWINGS

151-220-104 Wiring Diagram
660-326-202 PCB circuit diagram
660-326-302 PCB Loading

5. HIGH VOLTAGE TESTING

- a) Apply 2KV RMS. between the terminal groups as listed in Group1 & Group 2 below for 1 minute.
- b) Apply three 5KV 1/50usec pulses of each polarity as listed in A & B below.

Group 1

1,3,5,7,9,11,13,14,15,16,17,19

1,3,5,7,15,16,26,28

1,3,5,7,9,11,13,14,22,24

Group 2

22,24,26,28 + E

9,11,13,14,17,19,22,24+ E

15,16,17,19,26,28 + E



6. CALIBRATION & TEST PROCEDURE

6.1 Initiation

- a) Apply the auxiliary supply to terminals 1 & 5 with 1 being positive, ensure the "dummy" CB auxiliary contact is closed (CB in tripped position)
- b) Apply a voltage pulse of 75% nominal volts and a pulse length >40 mS to the shunt initiate input (terms 3 & 1). RL1 should pick up and hold itself operated via contact RL1-1.

6.2 Reclose timer Calibration.

- a) Set R33 to its approximate mid point
- b) Set front panel switches to Auto reset and Dead line
- c) Select divide ratio of MC14541 (U03) to 1024 by setting pin 12 (J11 to link B) to zero volts and pin 13 (J12 to link C) to positive 10 volts.
- d) Connect a device for measuring period to TP01-C with TP01-B (Gnd) and ignoring actual values set the ratio of minimum and maximum dial setting to 20 : 1 by adjusting R16.
- e) Set "reclose" control fully clockwise and select C7 & C8 combination to achieve a period of 19.5 mS.
- f) Check the period at minimum setting this should be 0.98 mS and maximum setting 19.5 mS.
- g) Record results

Minimum	Maximum	Nominal	Actual	Unit
0.0	1.0	0.5		s
3.5	4.5	4.0		s
6.5	7.5	7.0		s
9.5	10.5	10.0		s

6.3 Two Second Pulse

Connect the oscilloscope to TP01-D and TP01-I and adjust R23 for a two second pulse at this point. ie 2 seconds from when TP01-D goes low and when TP01-I goes high.

Minimum	Maximum	Nominal	Actual	Unit
1.9	2.1	2.0		s

6.4 Calibration of the Reclaim Timer

- a) Select divide ratio of MC14541 (U04) to 8192 by setting pin 12 (J13 to link F) to zero volts and pin 13 (J14 to link H) to zero volts.
- b) Connect a device for measuring period to TP01-G with TP01-B (Gnd) and ignoring actual values set the ratio of minimum and maximum dial setting to 20 : 1 by adjusting R20.



6. CALIBRATION & TEST PROCEDURE (Cont.)

6.4 Calibration of the Reclaim Timer (Cont.)

- c) Set "reclaim" control fully clockwise and select C12 & C13 combination to achieve a period of 24.42 mS.
- d) Check the period at minimum setting this should be 1.221 mS and maximum setting 24.42 mS.
- e) Record results

Minimum	Maximum	Nominal	Actual	Unit
0	10	5		s
35	45	40		s
65	75	70		s
95	105	100		s

7. GENERAL & FUNCTIONAL

- a) Set switches to Auto reset and Dead line and apply nominal supply voltage to the voltage blocking input. Make sure the "dummy" CB is in the tripped position indicating a fault condition.
- b) Apply an initiate pulse, RL1 should operate and hold in via its RL1-1 contact. The reclose timer will commence to time out after application of the initiate pulse.
- c) At the end of the time setting of the reclose timer, RL2 operates and will remain operated for 2 seconds. The "reclose" LED on the front panel will be illuminated during this time.
- d) When the "dummy CB" has re-closed the reclaim timer will commence and the relay will reset after the reclaim time expires.
- e) If the mode switch was set to "S", the relay will go to lockout after the reclaim time expires and will require a manual reset (panel push button).
- f) If the fault has not cleared ("dummy" CB fail to close) then the relay will go to lockout after the reclaim time expires and will require a removal of auxiliary supply.
- g) Set the blocking switch to Live Line and the "dummy CB" to tripped. Apply an initiate pulse, RL1 will pick as will RL3 and the relay will go directly to lockout and will require a removal of auxiliary supply.

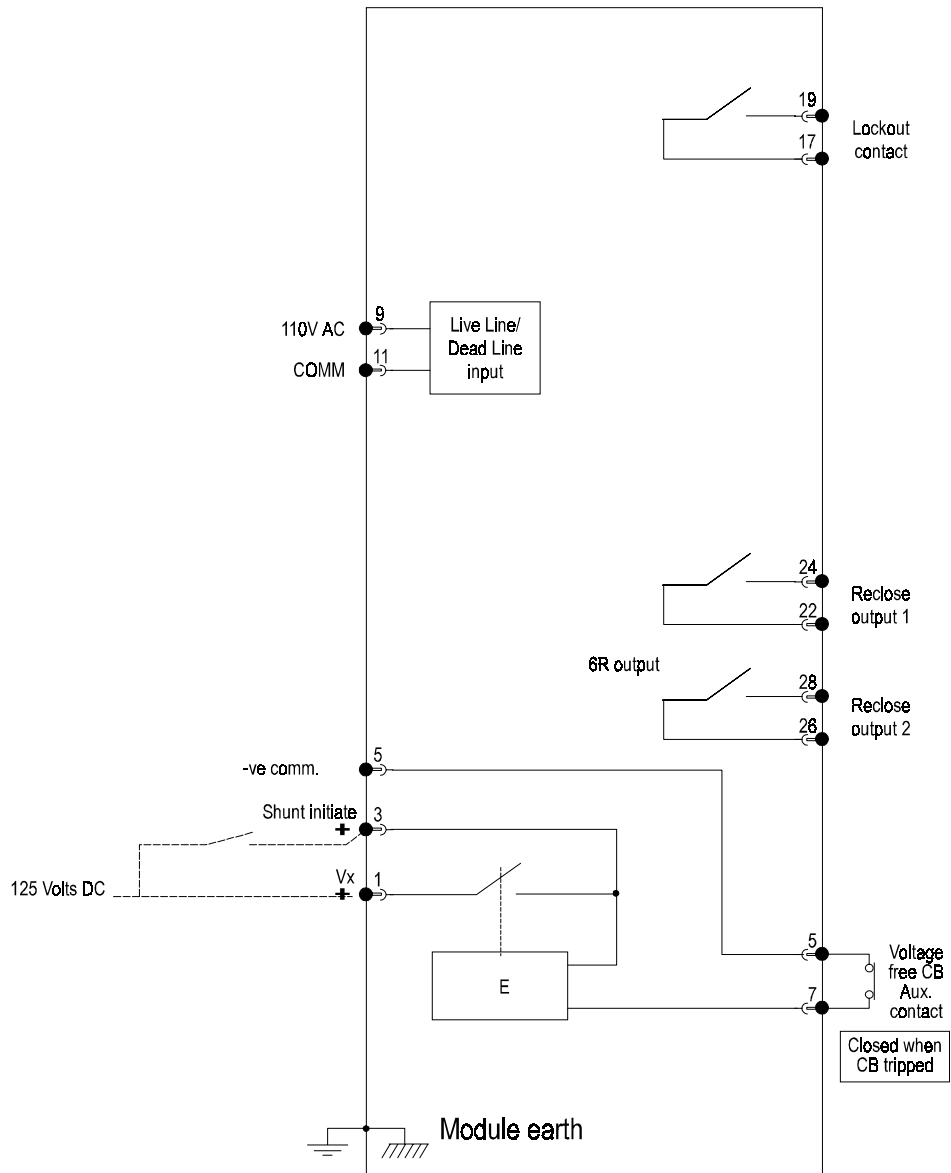
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- h) Check that the relay is electrically sound and mechanically robust as per Standard Inspection & Test Schedule 903.000.026.

PASS

TESTED BY: _____ DATE: _____

8. CONNECTION DIAGRAM



9.0 TIMING DIAGRAM

