

# PRODUCT/TEST MANUAL

## 1B220K1

### SINGLE SHOT AUTO-RECLOSE



Order Number

Serial Number

Issue	Date	Summary of changes
A	5/10/00	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 may be initiated by either a series or a shunt arrangement as selected. 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 current (series initiate) or a voltage (shunt initiate) to a double 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 (double wound)

Series initiate	Current	1.2A
	Pulse Length	>40mS
	Resistance	<0.05 Ohms
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"

**Counter** 7 digit non resettable

## 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

Reclose Contact

With magnetic blowout & arcing horns

Break 2 Amps @ 250 VDC L/R=50 ms

10 times @ 30 second intervals

### 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

151-220-101      Wiring Diagram  
660-326-201      PCB circuit diagram  
660-326-301      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	Group 2
1,3,5,7,9,11,15,16,17,19	22,24,26,28 + E
1,3,5,7,15,16,26,28	9,11,17,19,22,24+ E
1,3,5,7,9,11,22,24	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 current pulse of 1.2 Amps and a pulse length of >40 mS to the series initiate input (terms 15 & 16). RL1 should pick up and hold itself operated via contact RL1-1.
- c) Remove & reapply the auxiliary voltage to reset the relay with term 15 as positive.
- d) Apply a voltage pulse of 75% nominal volts and a pulse length >40 mS to the shunt initiate input (terms 3 & 5). RL1 should pick up and hold itself operated via contact RL1-1.
- e) Reapply the current pulse and make sure that the relay does not drop out. This tests for correct coil polarity.

**6.2 Reclose timer Calibration.**

- a) Set front panel switches to Auto reset and Dead line
- b) Select divide ratio of MC14541 to 1024 by setting pin 12 (link B) to zero volts and pin 13 (link C) to positive 10 volts.
- c) Connect a device for measuring period to TP01-C and ignoring actual values set the ratio of minimum and maximum dial setting to 20 : 1 by adjusting R16.
- d) Set "reclose" control fully clockwise and select C7 & C8 combination to achieve a period of 19.5 mS.
- e) Check the period at minimum setting this should be 0.98 mS and maximum setting 19.5 mS.
- f) 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 to 8192 by setting pin 12 (link F) to zero volts and pin 13 (link H) to zero volts.
- b) Connect a device for measuring period to TP01-G 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 voltages. Make sure the "dummy" CB is in the tripped position indicating a fault condition.
- b) Apply an initiate pulse (either current or volts), 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.

OK

- h) For full timing details refer to the timing waveforms in the product Maintenance Manual.
- i) 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

