M. Fuse Holder. Fuse holders on the front panel shall be the low profile type.

962.06 Functional Requirements.

A. General. The Monitor monitors the cabinet for conflicts and unsafe operation. If an unsafe condition exists, the Monitor will enter into a FAILED state. This places the cabinet into flash operation and applies STOP TIME to the controller unit. The Monitor shall be designed to monitor red circuits, yellow timing, multiple outputs and lack of outputs on a switch selectable, per channel basis. Specific conditions for failure follow:

1. 24VDC FAIL: The cabinet +24 volts DC does not meet the specified thresholds.
2. CONFLICT: When the green or yellow input to one or more channels is ON and they are not programmed as permissive on the Conflict Program Card.
3. WATCHDOG TIMER (WDT) ERROR: When the 170E/2070 controller unit watchdog output has ceased.
4. CONFLICT PROGRAM CARD AJAR: Illuminates when the Conflict Program Card has been removed or is not properly seated in the connector. When it is not inserted into the monitor, the warning indicator light shall be displayed.
5. MONITOR FAILURE: A fault is detected within the operation of the 2010 Monitor itself.
6. MULTIPLE OUTPUTS: Simultaneous indications of Green, Yellow or Red field outputs on a single channel.
7. RED FAIL: No active field outputs on a single channel (green/yellow/red).
8. YELLOW ERROR: The absence of a minimum yellow field output during a green to red sequence. Minimum yellow shall be 2.7 seconds ± 100 ms

B. Operating Range. The Monitor Unit shall be fully operational from an 85 to 135 V ac power source. Below 85 V ac ± 2 V ac, the Monitor shall suspend Fault monitoring, close the output relay, and de-energize the AC POWER indicator light.

C. Watchdog Timing. WATCHDOG Timing Circuitry shall be provided to monitor the controller unit WATCHDOG output. The WDT Circuitry shall sense state change and the time between the last change. An absence of change for 1.5 ± 0.1 seconds shall place the Monitor in a FAILED state.

D.Channels Monitored. The Monitor shall sense and respond to conflicts and 24VDC failures whenever the AC line voltage is within the 85 to 135 V ac operating range of the Monitor, except during FAULT RELAY OPERATION.

E. Yellow Inhibit. Means shall be provided to selectively inhibit the monitoring of a Yellow channel input.

F. Power Fail after Fault. In the event that the Monitor senses a fault, followed by a loss of operating voltage, the initial Failure Status shall be retained in memory and redisplayed after

restoration of power.

1. Once the Monitor is LATCHED in a fault condition for any reason, including the removal of the Conflict Program Card, it shall REMAIN LATCHED, even through a power fail/recovery, until a RESET is issued by the front panel reset switch, or by the external test reset line.
2.. Status of the Green, Yellow, and Red inputs of all channels, at the time the fault was latched shall be displayed. Power loss shall not affect the retention of this data. An acceptable alternative is to save status of all channels in memory and only display the latched fault.

G. Insertion / Removal of Unit. It shall be possible to insert and remove the Monitor while the cabinet is energized without placing the cabinet into Flash operation provided that: The cabinet door remains open and the reset switch is held depressed while the unit is being inserted or removed. Any momentary disruption of field signal indications shall be less than 500 ms.

H. Microprocessor Use. If a microprocessor is used in the Monitor design, its program shall be written so that:

1. Integrity tests shall be performed periodically on each memory cell of each memory device, relevant to each device type.
2. Hardware external to the microprocessor circuits shall be employed to constantly sense proper microprocessor operation.
3. The Monitor shall revert to a FAILED state if a fault is detected with the microprocessor or during integrity tests.

I. Front Panel Indicators. The Monitor shall have red/yellow/green indicators for channel inputs and indicators to provide status and failure detection information. The AC POWER indicator shall be GREEN. All indicators shall be clearly readable in direct sunlight. The indicators shall be arranged and labeled as shown below:

1. AC POWER: Shall illuminate when the incoming AC Line Voltage exceeds 103 ± 2V ac, and shall FLASH during FAULT RELAY OPERATION.
2. VDC FAIL: Shall illuminate when the Monitor has detected a 24VDC failure.
3. CONFLICT: Shall illuminate when a conflicting signal condition has been detected.
4. WDT ERROR: Shall illuminate when a Watchdog error has been detected. No switch or similar device shall be provided to disable WDT monitoring.
5. PC AJAR: Shall illuminate when the Conflict Program Card has been removed or is not properly seated in its connector.
6. MON FAIL: Shall illuminate to indicate an internal Monitor failure.
7. RED FAIL: Shall illuminate when the Monitor detects that there is no active output on any of the field outputs that comprise a monitored channel. The failed channels shall be displayed on the corresponding channel indicators. If for any reason red fail is not enabled, the red fail indicator light shall flash at approximately 2hz.