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MICRO-SCREEN® Standard and V-Series

System Semi-Annual Checkout Procedure for Latch and Trip Systems

To Be Performed at 6-Month Intervals:

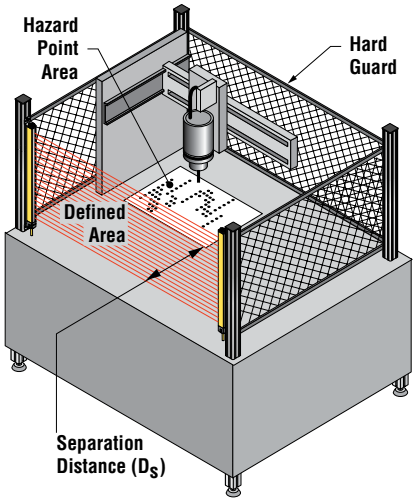
This Semi-Annual checkout must be done by a **Qualified Person** who possesses all of the manufacturer-provided information on the MICRO-SCREEN System and guarded machine and who, by possession of a recognized degree or certificate of professional training or who, by extensive knowledge, training, or experience, has successfully demonstrated the ability to solve problems relating to the installation, operation, and maintenance of optoelectronic machine guards.

A copy of checkout results should be kept in the employer's files: see OSHA 1910.217(e)(1).

The Qualified Person must:

1) Examine the guarded machine to verify that it is of a type and design that is compatible with the MICRO-SCREEN System. **MICRO-SCREEN Systems MAY NOT BE USED with the following machinery:**
   - Any machine that cannot be stopped immediately after a stop signal is issued, such as single stroke (also known as "full-revolution") clutched machinery.
   - Any machine with inadequate or inconsistent machine response time and stopping performance.
   - Any machine that ejects materials or component parts through the defined area.
   - MICRO-SCREEN Systems may not be used in any environment that is likely to adversely affect photoelectric sensing system efficiency. For example, corrosive chemicals or fluids or unusually severe levels of smoke or dust, if not controlled, may degrade the efficiency of Banner MICRO-SCREEN Systems.

   Banner MICRO-SCREEN Systems may not be used as tripping devices to initiate machine motion (PSDI applications) on mechanical power presses, per OSHA regulation 29 CFR 1910.217.
2) Examine the electrical wiring connections between the MICRO-SCREEN output relays and the guarded machine's control elements to verify that the requirements stated in Section 3.5 of the MICRO-SCREEN manual are met.
3) Perform MICRO-SCREEN System Daily Checkout procedure (see Checkout Card p/n 48751, or Section 6.3 of the MICRO-SCREEN manual).
4) Remove electrical power from the MICRO-SCREEN System. All output relays should immediately de-energize, and should not be capable of being reactivated until power is re-applied and a Key Reset is performed (unless the Auto Power-up feature is ON).



The formula used to calculate the separation distance is:

$$D_S = K \times (T_S + T_r) + D_{pf}$$

where:

D_S = the separation distance;

K = the OSHA-recommended hand speed constant of 63 inches per second (NOTE 1, below);

T_S = the overall stop time of the machine measured from the application of the "stop" signal to the final ceasing of all motion (including stop times of all relevant control elements, measured at maximum machine velocity). See NOTE 2, below.

T_r = the response time of the MICRO-SCREEN System: .038 Seconds

D_{pf} = the added distance due to depth penetration factor, as prescribed in OSHA 1910.217 and ANSI B11 standards:

Floating Blanking Program	Standard Series sensor pairs	V-Series sensor pairs
Floating blanking OFF	D_{pf} = 1.6"	D_{pf} = 3.3"
1-beam blanking ON	D_{pf} = 3.3"	D_{pf} = 6.7"
2-beam blanking ON	D_{pf} = 5.0"	D_{pf} = 31.5"

NOTES:

1) The OSHA-recommended hand-speed constant K has been determined by various studies, and although these studies indicate speeds of 63 in/sec to over 100 in/sec, they are not conclusive determinations. The employer should consider all factors, including the physical ability of the operator, when determining the value of K to be used.
2) T_S is usually measured by a stop-time measuring device. If the specified machine stop time is used, we recommend that at least 20% be added as a safety factor to account for clutch/brake system deterioration.
3) Use of floating blanking will always cause the required D_S to increase.

Figure 1. Calculation of Separation Distance (D_S).

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5) Test the machine stopping response time using an instrument designed for that purpose to verify that it is the same or less than the overall system response time specified by the machine manufacturer. (NOTE: Banner's Applications Engineering Department can recommend a suitable instrument.) If any decrease in machine braking ability has occurred, make the necessary clutch/break repairs, recalculate the separation distance (safety distance), readjust D_S appropriately (see Figure 1), and again perform the checkout sequence above. If the safety distance has changed, record the new distance on the Daily Checkout Card (p/n 48751).

6) Examine and test the Machine Primary Control Elements (MPCEs) to ensure that they are functioning correctly and are not in need of maintenance or replacement.

7) Inspect the guarded machine to ensure that there are no other mechanical or structural problems that would prevent the machine from stopping or assuming an otherwise safe condition when signalled to do so by the MICRO-SCREEN System.

8) Examine and inspect the machine controls and connections to the MICRO-SCREEN System to ensure that no modifications have been made which adversely affect the system.

9) Examine the electrical wiring connections between the MICRO-SCREEN output relays and the guarded machine's control elements to verify the requirements stated in Section 3.5.6. of the MICRO-SCREEN manual.

WARNING . . . Calculate the Separation Distance Carefully

Failure to maintain appropriate separation distance can result in serious bodily injury or death.

WARNING . . . Shock Hazard

A shock hazard exists while the lockable enclosure is open. **Before continuing, verify that the enclosure is closed and latched. Failure to do so could cause serious injury or death.**

WARNING . . . Do Not Use Machine If System Does Not Check Out

If *all* of the these checks cannot be verified, do not use the MICRO-SCREEN System/guarded machine until the defect or problem has been corrected (see Section 5 of the MICRO-SCREEN manual). **Doing so could result in serious bodily injury or death.**