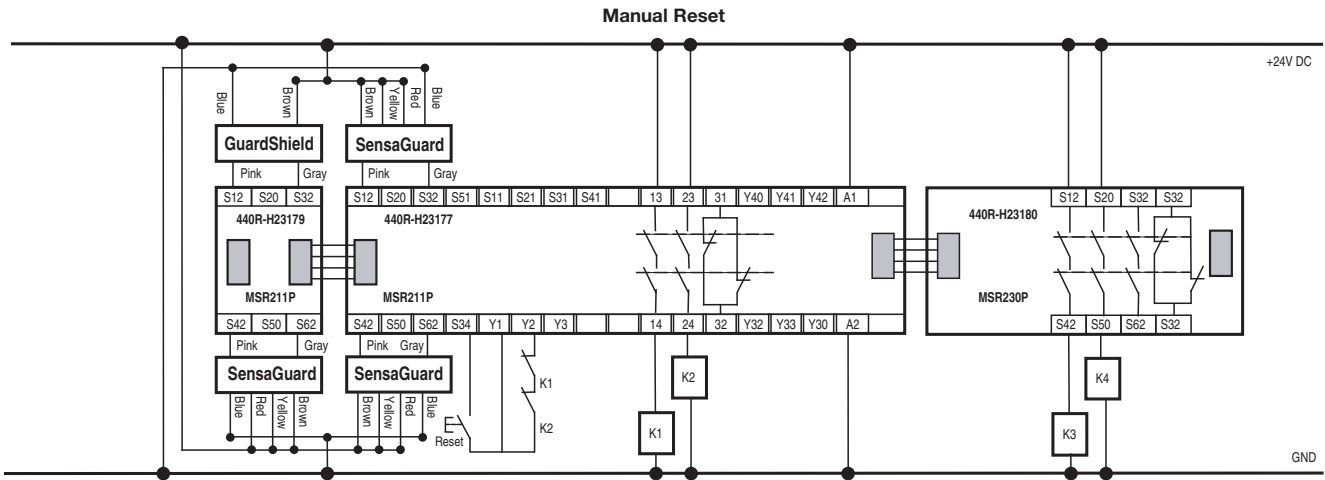
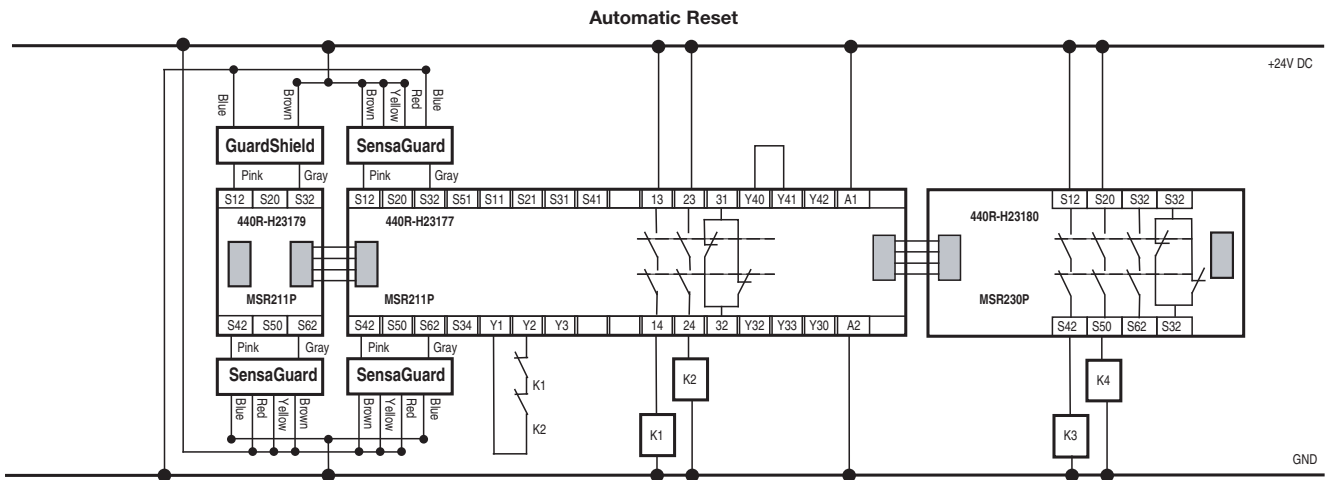


MSR200 Series with Three Sensors and One Light Curtain



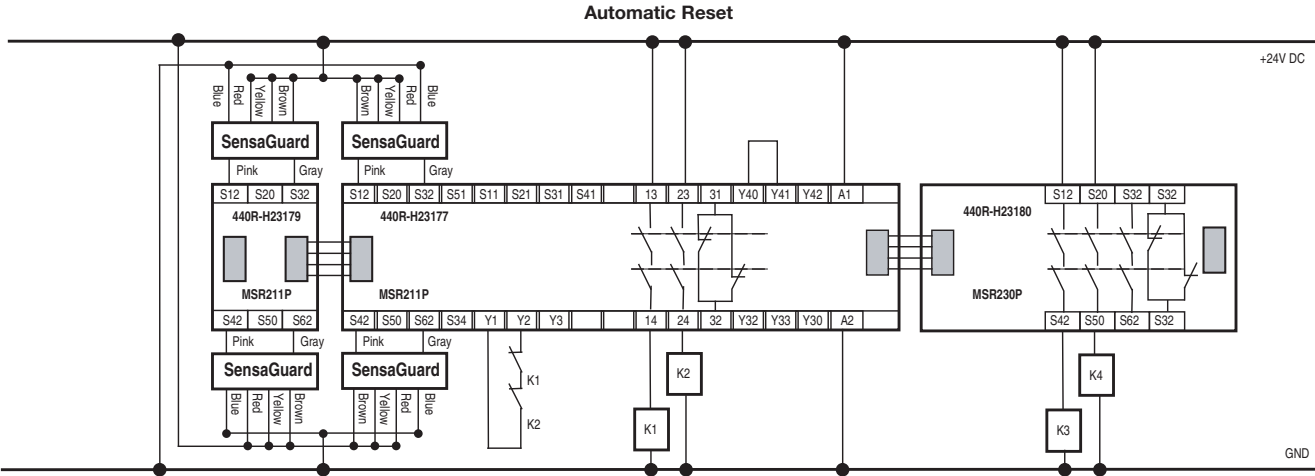
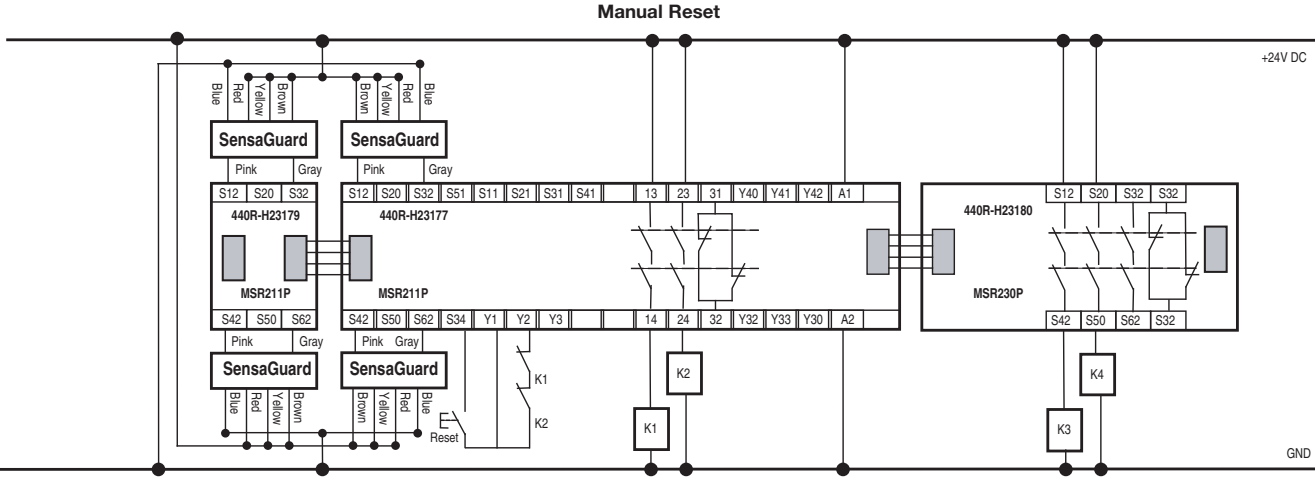
Note: Light curtain can be attached to any input.



Note: Light curtain can be attached to any input

3-Interlock Switches

MSR200 Series with Four Sensors



3-Interlock Switches

Product Selection

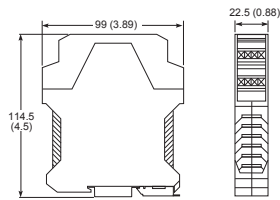
Inputs	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. No.
NA	4 N.O.	—	Removable	—	24V DC from the base unit (terminals only)	440R-H23180

Accessories

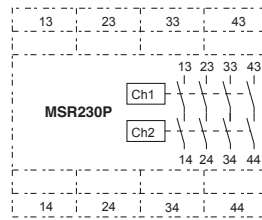
Description	Cat. No.
Bag of 4, 4-Pin Screw Terminal Blocks	440R-A23209
Bag of 4, 4-Pin Spring Clamp Terminal Blocks	440R-A23228

Approximate Dimensions

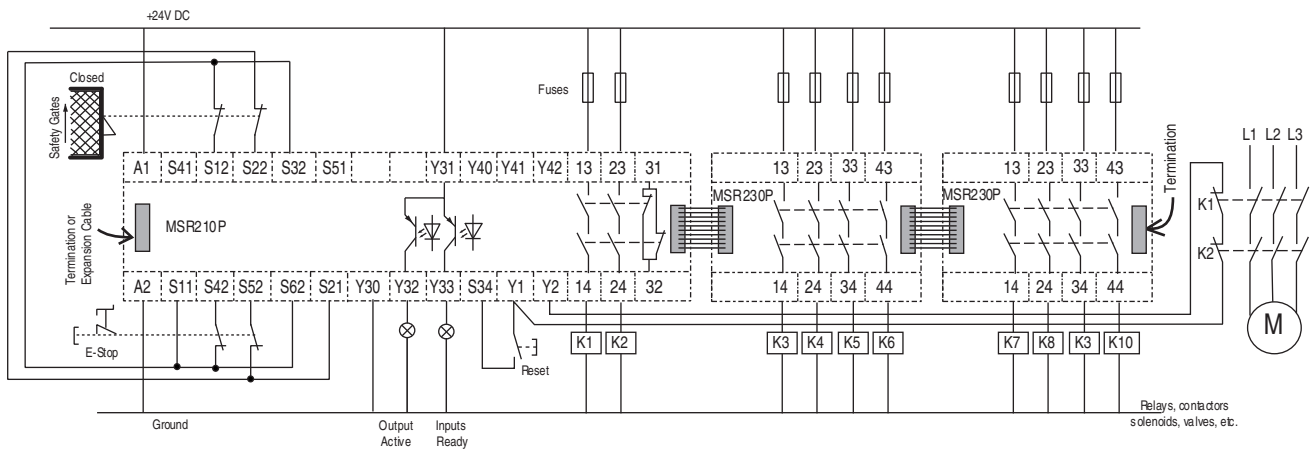
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



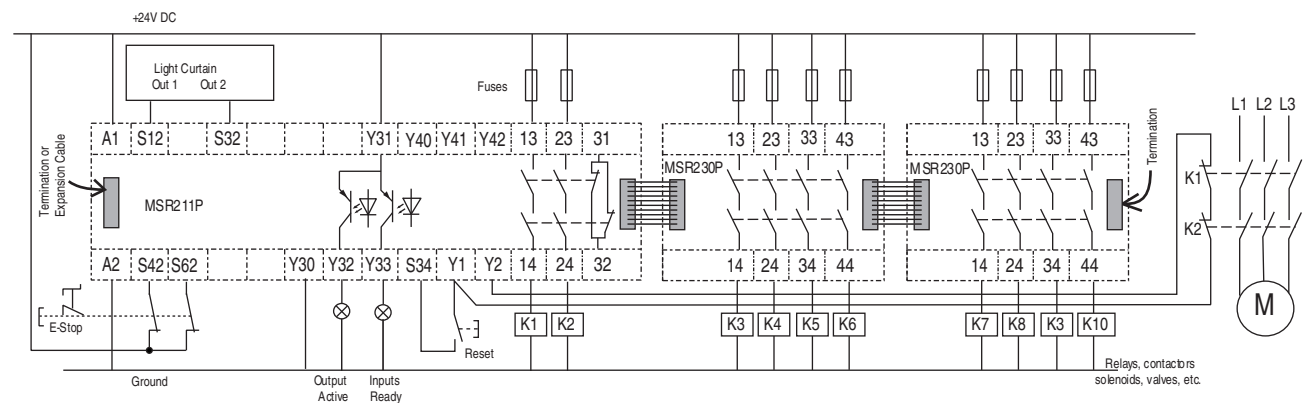
Block Diagram



Typical Wiring Diagrams



Dual Channel Safety Gate and E-Stop, Monitored Manual Reset, Monitored Output

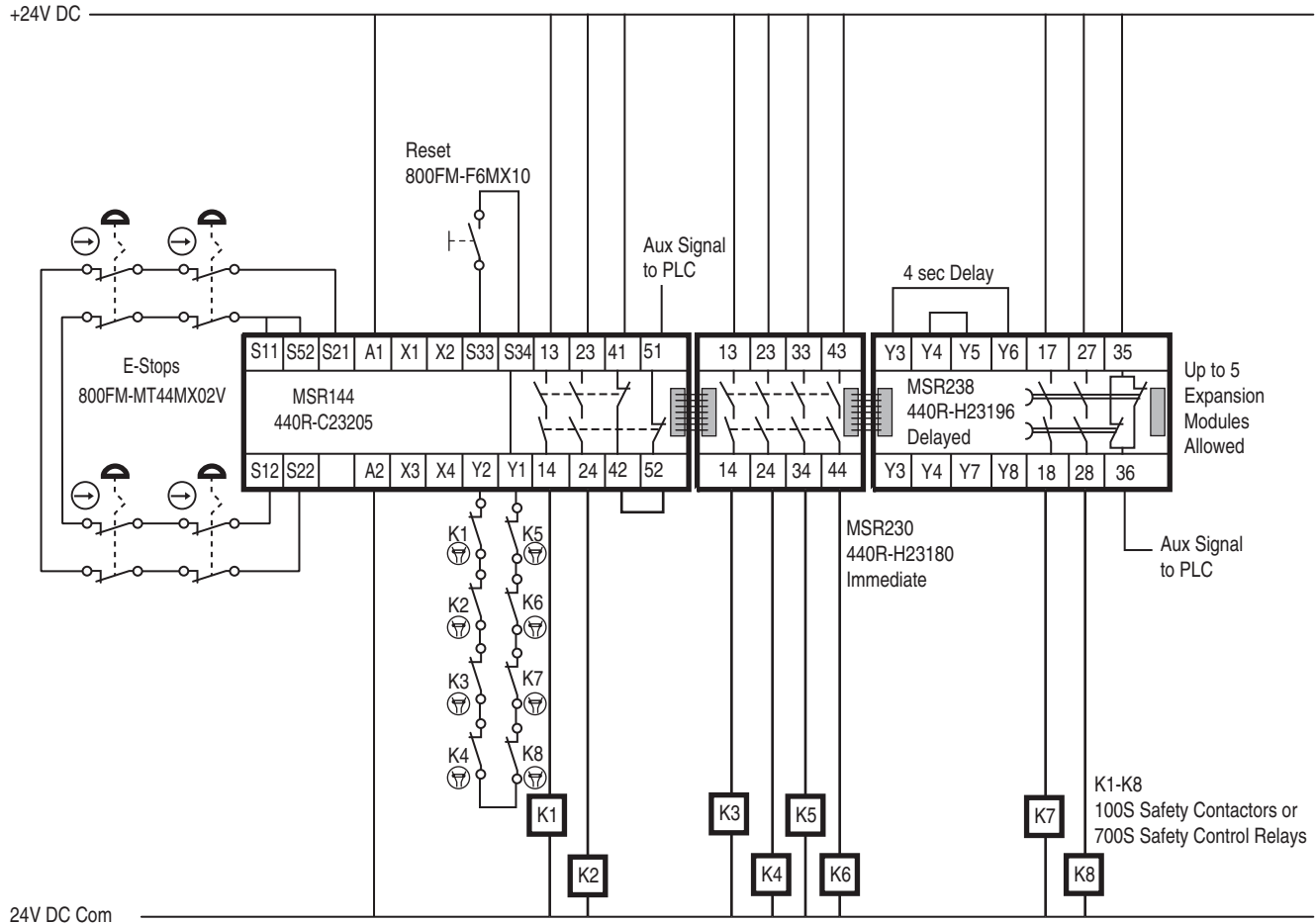


Light Curtain and Dual Channel E-Stop, Monitored Manual Reset, Monitored Output

5-Safety Relays

Expandable Outputs—E-Stop with Immediate and Delayed Outputs

800F, MSR144, MSR230, MSR238, 100S, 700S



Circuit Status

The e-stop is reset. The safety outputs of the MSR144, MSR230 and MSR238 are de-energized. The motor is off.

Operating Principle

The MSR144 was chosen for its ability to expand its outputs with a combination of MSR230 and MSR238 modules. Up to five modules can be added to one MSR144. Ribbon cables on the front of the relay extend control of the MSR144 to MSR230 and MSR238. Without jumpers to X1/X2 and X3/X4, the MSR144 is set to monitored manual reset.

STARTING: Press and release the reset button to energize the outputs of the MSR144, MSR230 and MSR238. K1-K8 safety contactors or safety control relays energize to control the hazardous portion of the machine.

STOPPING: When an e-stop is pressed, the safety outputs of the MSR144 and MSR230 immediately turn off and de-energize K1-K6. Four seconds later, the safety outputs of the MSR238 turn off and de-energize K7 and K8.

Fault Detection

Upon power-up, the MSR144 performs internal checks. The checks also include verification that the MSR230 and MSR238 modules are in the off state. The MSR144 then looks for dual signals from the e-stop circuit. A crossfault on the e-stop circuit will be detected by the MSR144. With the e-stop signals made, closing the reset button places a voltage to the Y2 terminal. The external devices (K1 through K8) are checked to confirm they are off. A fault in K1 through K8 will cause their normally closed contacts to remain open, and this fault will be detected by the MSR144.

Ratings

The safety function initiated by the series connection of 800F e-stop buttons meets the safety performance requirements of SIL CL 2 per IEC 62061:2005 and has Category 3 structure that can be used in systems requiring Performance Levels up to PLd per ISO 13849-1: 2006. The Category 3 rating requires the redundant usage of K1-K8 to de-energize the machine actuators, and the contactors must be monitored by the safety system. This example circuit performs a Stop Category 0 function (coast to stop).