

Safety Category 1 Application Note

Application:

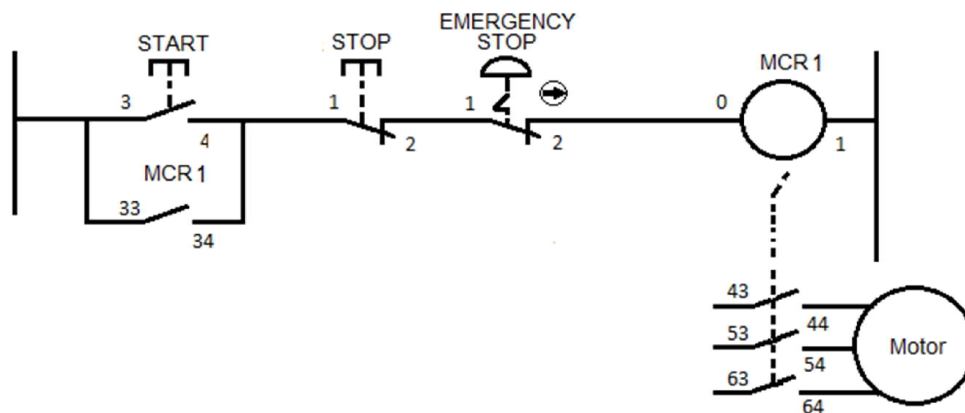
Category 1: Simple E-Stop circuit.

With all safety circuits a risk assessment should be performed to determine what level of safety devices and circuits should be used within the system. If the system has been classified as needing a Category 1 circuit this application note should provide some understanding of what is needed to achieve this rating. When designing a Category 1 circuit all interlock devices should be in a positive mode of operation. Wiring should be routed and protected in a manner to prevent short circuiting or earth ground faults. Contactors should have their power contacts protected by an overcurrent cut-out device to prevent welding. Insulation should be in accordance with the relevant clauses of standard IEC 60204-1.

With a Category 1 circuit the following functions need to apply:

- 1) Basic safety circuit configuration for ground faults.
- 2) Control circuit forced opened directly by a safety switch in positive operation (In this application: E-Stop).
- 3) Use of parts such as switches and relays that conform to EN and other standards (In this application: Start, Stop pushbuttons, G7SA relay).

Below shows an example of a simple safety circuit that would be good for a Category 1 rating:

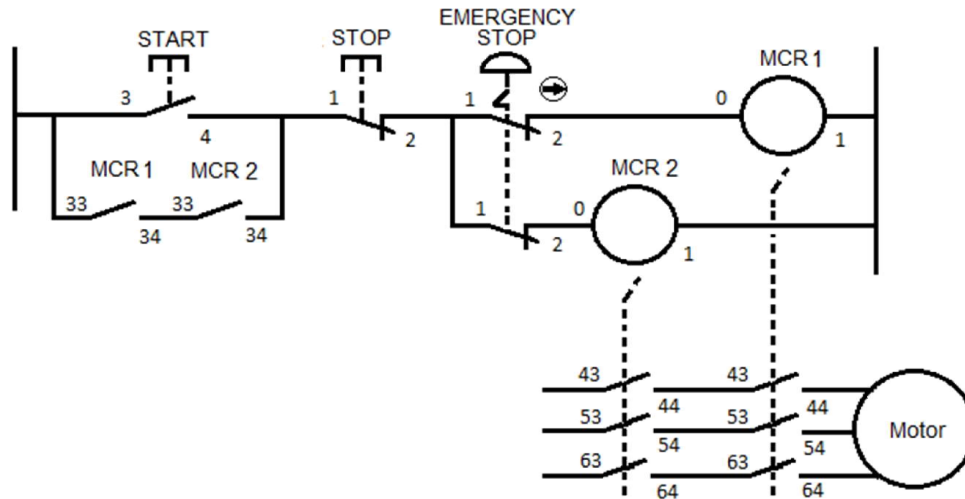


Note: This circuit using the G7SA can be used with a load that draws less than 6 Amps, if more than 6 amp load G7SA can be substituted with a J7 contactor to carry the load. If the circuit requires more emergency stops, add them in series with the circuit.

Bill of materials:

QTY		Part Number	Description
1		A22NN-BGM-NGA-G100-NN	Green, Full guard, SPST, Momentary, Start Pushbutton
	Sub Assy:		
	QTY	Part Number	Description
	1	A22NZ-BGM-NGA	Operation Unit, Green, Full guard, Momentary
	1	A22NZ-H-01	Mounting Collar
	1	A22NZ-S-G1A	SPST-NO (blue) contact block
1		A22NN-BPM-NRA-G100-NN	Red, Projected, SPST, Momentary, Stop Pushbutton
	Sub Assy:		
	QTY	Part Number	Description
	1	A22NZ-BPM-NRA	Operation Unit, Red, Projected, Momentary
	1	A22NZ-H-01	Mounting Collar
	1	A22NZ-S-G1A	SPST-NO (blue) contact block
1		A22E-MP-01	Red, Mushroom, Medium 40 dia., SPST-NC, E-Stop Pushbutton
1		A22Z-3466-1	Legend Plate "EMERGENCY STOP" 60 Diameter
1		G7SA-4A2B	Force guided Relay, 4PST-NO, DPST-NC
1		P7SA-14F	Track Mounting Socket for G7SA

If a dual channel is preferred you can use the following drawing which would give a higher level of reassurance the circuit works, but this still falls under a category 1:



Bill of Material:

This would be the same bill of material for the single channel shown above but with the following added:

QTY		Part Number	Description
1		A22-01	Switch Block SPST-NC
1		G7SA-4A2B	Force guided Relay,4PST-NO, DPST-NC
1		P7SA-14F	Track Mounting Socket for G7SA