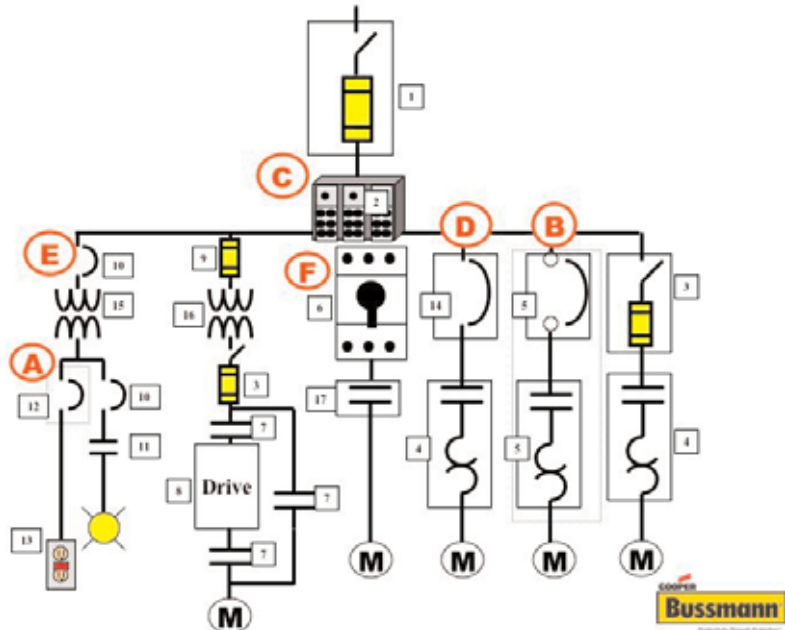
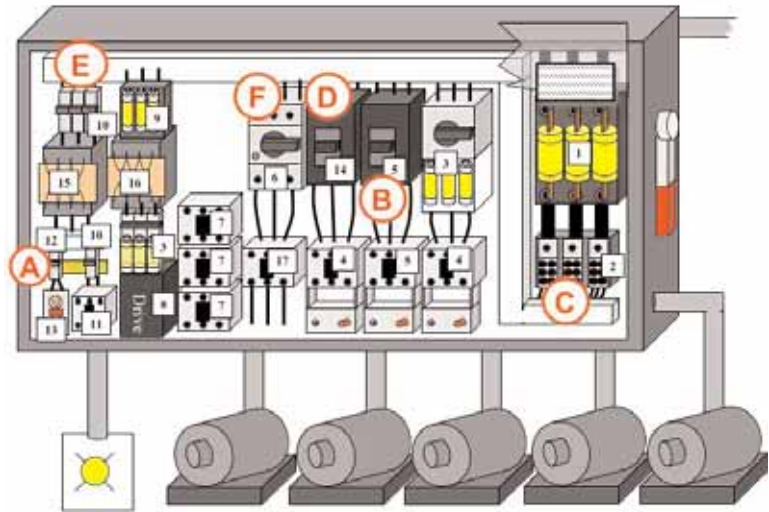


Industrial Control Panel Example

The following is an example of an industrial control panel assembly along with a one line diagram of the circuitry. The components, their ratings and any special conditions associated with their use is shown in the components list to the left.

Components List

1. Fusible disconnect with LPJ-100SP fuses IR = 300kA. SCCR of disconnect with fuses installed = 200kA.
2. Unmarked power distribution block SCCR = 10kA default.
3. Fusible disconnect with LP-CC fuses (IR = 200kA) SCCR = 200kA.
4. Motor starter marked 50kA when protected by fuses or circuit breaker.
5. UL489 instantaneous trip circuit breaker (MCP) used in conjunction with appropriate motor controller and overload relay as a listed assembly with a *combination* SCCR = 25kA. MCP not marked with an interrupting rating.
6. Self protected Type E combination controller marked with a 50kA SCCR.
7. Motor controller (contactor) marked with a 5kA SCCR.
8. Drive marked with a 10kA SCCR
9. LP-CC fuses marked with a 200kA IR in a fuse holder with a marked SCCR = 200kA.
10. Molded case circuit breaker marked with a 10kA IR.
11. Lighting contactor marked with a 2kA SCCR.
12. Unmarked UL1077 supplemental protector. SCCR = 200A by default.
13. Unmarked GFCI receptacle SCCR = 2kA by default.
14. Molded case circuit breaker marked with a 14kA IR.
15. 5kVA transformer (480:120V).
16. 10kVA isolation transformer (480:480V).
17. Motor controller (contactor) marked with a 50kA SCCR.










IR = Interrupting rating

SCCR = Short-circuit current rating






Weak Links and Improving SCCR

The following table highlights the weak links encountered in the example on the previous page and provides Cooper Bussmann solutions, along with the added benefits that these solutions can provide for a design. This is an example of how Cooper Bussmann

can help **Find** the **weakest link**, **Fix** the **weakest link** and **Forget** about any future worries or aggravations in a design. Cooper Bussmann will provide the most versatile and reliable design for any overcurrent protection need.

Weak Link	Component	Fix It
 <p>A</p>	<p>UL1077 Supplementary Protectors (component #12)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> The default IR of 200A is less than the limits allowed for a 5kVA transformer. <p>Assembly Limited To 200A.</p>	<p>Increase the Interrupting Rating:</p> <ul style="list-style-type: none"> Use Cooper Bussmann current-limiting fuses to achieve higher SCCRs by replacing the low short-circuit rated UL1077 supplementary protector with modern current-limiting fuses with high IRs of up to 300kA. 
 <p>B</p>	<p>UL489 Instantaneous Trip Circuit Breaker (component #5)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> The interrupting rating for the instantaneous trip circuit breaker is not marked on the device and therefore the default value of 5kA must be used for Sweep 2. <p>Assembly Limited To 5kA:</p> <ul style="list-style-type: none"> If weak link A is fixed. 	<p>Increase the Interrupting Rating:</p> <p>Use Cooper Bussmann current-limiting fuses to achieve higher short-circuit current ratings by replacing the low interrupting rated instantaneous trip circuit breaker with modern current-limiting fuses with high interrupting ratings of up to 300kA.</p> 
 <p>C</p>	<p>Power Distribution Block in Feeder Circuit (component #2)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> The power distribution block is not marked with a SCCR so default rating of 10kA must be used. <p>Assembly Limited To 10kA:</p> <ul style="list-style-type: none"> If weak links A and B are fixed. 	<p>Use Current Limitation:</p> <p>If the PDB is fed by a Cooper Bussmann modern current-limiting LPJ, JJS, or LP-CC fuse rated 60A or less upstream, the current limitation of the fuse can be used to raise the rating of the PDB to 100kA or more.</p> <p>Use NEW PDB Series of Power Distribution Blocks with High Short-Circuit Current Rating:</p> <p>Cooper Bussmann has introduced a line of power distribution blocks Listed to UL1953 with high SCCRs of 200kA or more. By replacing a present low rated power distribution block with the new Cooper Bussmann PDBs, a panel can achieve the high ratings desired!!</p>  

Weak Links and Improving SCCR

Weak Link	Component	Fix It
<p style="text-align: center;">D</p> 	<p>Molded Case Circuit Breakers with Low Interrupting Ratings (component #14)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> • Low 14kA interrupting rating becomes lowest rated component and limits assembly rating. <p>Assembly Limited To 14kA:</p> <ul style="list-style-type: none"> • If weak links A, B, and C are fixed. 	<p>Increase the Interrupting Rating:</p> <p>Use Cooper Bussmann current-limiting fuses to achieve higher short-circuit current ratings by replacing the low interrupting rated circuit breaker with modern current-limiting fuses with high interrupting ratings of up to 300kA.</p> 
<p style="text-align: center;">E</p> 	<p>Molded Case Circuit Breakers with Low Interrupting Ratings (component #14)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> • This example is different from D in that the interrupting rating of the overcurrent protective device on the lineside of the 5kVA transformer can be used for the entire secondary circuitry. The low 14kA interrupting rating becomes lowest rated component and limits assembly rating. <p>Assembly Limited To 14kA:</p> <ul style="list-style-type: none"> • If weak links A, B, C, and D are fixed. 	<p>Increase the Interrupting Rating:</p> <p>Use Cooper Bussmann current-limiting fuses to achieve higher SCCR's by replacing the low interrupting rated circuit breaker with modern current-limiting fuses with high interrupting ratings of up to 300kA.</p> 
<p style="text-align: center;">F</p> 	<p>Type E Self Protected Combination Starter (component #6)</p> <p>Limiting Factor:</p> <ul style="list-style-type: none"> • Slash voltage rating limits the application options for an assembly to a solidly grounded Wye system line-to-ground interrupting capability is limited. <p>Assembly Limited To 480/277V:</p> <ul style="list-style-type: none"> • Limited to solidly grounded WYE type systems only. 	<p>Use Device With Straight Voltage Rating:</p> <p>Use Cooper Bussmann current-limiting fuses with straight voltage ratings to allow for installation on any type of system grounding.</p> 

If weak links A, B, C, D, E and F are fixed through the use of Cooper Bussmann current-limiting fuses, and if a new Cooper Bussmann power distribution block is used, the new short-circuit current rating is now 200kA.

For further information contact your local Cooper Bussmann sales engineer, Cooper Bussmann Application Engineering, or visit www.cooperbussmann.com.