HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 322)

Start / Stop Station /w/ Momentary Contacts

The purpose of the lesson is to correctly wire a start/stop (momentary) push button station.

Materials/Tools
A mock-up board, two hole push button enclosure, push button (red/w/NC momentary contact), push button (green/w/NO momentary contact), relay (with NO contact), relay socket, screw driver, wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
3. Mount relay socket.
4. Wire start/stop station.
5. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
6. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 323)

**Limit Switch (Pressure/Float/Vacuum/etc.)**

*The purpose of the lesson is to correctly wire a circuit using a limit switch to control a red light (top position) and a green light (bottom position).*

**Materials/Tools**
A mock-up board, two hole push button enclosure, red pilot light, green pilot light, limit switch (NO/NC contacts), screw driver and wire strippers. (Each training center will need to adjust according to their lab conditions.)

**Using a mock-up board:**
1. Draw ladder diagram.
2. Mount push button enclosure.
3. Mount pilot lights (red = top and green = bottom).
4. Install limit switch – red on / green off until switch is operated.
5. Wire circuit.
6. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
7. All work shall meet NEC requirements.

**Evaluation:**
- Verify each connection is wired correctly. Ensure all connections are tight.
- Record the results. Pass / Fail
- Students shall be retested until a Pass is recorded.

**General Instructors Tips:**
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 323)

Selector Switch

The purpose of the lesson is to correctly wire a circuit using a selector switch to control a red light (left position), a green light (right position) and center off.

Materials/Tools
A mock-up board, three hole push button enclosure, red pilot light, green pilot light, selector switch (3 position – maintained contacts), screw driver and wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
3. Mount pilot lights (red = top and green = center).
4. Install selector switch.
5. Wire circuit.
6. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
7. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 324)

Time Clock/Photocell/Selector Switch

The purpose of the lesson is to correctly wire a circuit using a time clock to control a light to turn off at 1 AM, a photocell to turn on the same light at dusk and a selector switch to control automatic/manual operation of the circuit.

Materials/Tools
A mock-up board, time clock, photocell, a push button enclosure, selector switch (3 position – maintained contacts), an octagon box with lamp holder, screw driver and wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
3. Mount time clock and photocell.
5. Install selector switch.
7. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
8. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 326)

Motor Starter (NEMA and IEC)

The purpose of the lesson is to correctly wire a motor starter.

Materials/Tools
A mock-up board, two hole push button enclosure, push button (red/w/NC momentary contact), push button (green/w/NO momentary contact), motor starter (with NO contact), overloads (for starter), screw driver, wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
4. Install overloads.
5. Wire motor starter.
6. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
7. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 326)

Start / Stop Station (Momentary Contacts) /w/ Indicating Light

The purpose of the lesson is to correctly wire a start/stop (momentary) push button station and an indicating light to indicate power to the relay.

Materials/Tools
A mock-up board, three hole push button enclosure, push button (red/w/NC momentary contact), push button (green/w/NO momentary contact), indicating light, relay (with NO contact), relay socket, screw driver, wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
3. Mount relay socket.
4. Wire start/stop station.
5. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
6. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)
HANDS ON ACTIVITY/PRACTICAL SKILLS TEST (LESSON 331)

Motor Starter - Reversing with Electrical Interlocks (NEMA and IEC)

The purpose of the lesson is to correctly wire a reversing motor starter.

Materials/Tools
A mock-up board, two hole push button enclosure, push button (red/w/NO maintained contact), push button (green/w/NO maintained contact), motor starter (with NO/NC contact), contactor (same size as starter – with NO/NC contact), overloads (for starter), screw driver, wire strippers. (Each training center will need to adjust according to their lab conditions.)

Using a mock-up board:
1. Draw ladder diagram.
2. Mount push button enclosure.
4. Install overloads.
5. Wire motor starter.
6. Ensure all connections are tight, each wire is trimmed and fastened in a craftsman-like manner.
7. All work shall meet NEC requirements.

Evaluation:
• Verify each connection is wired correctly. Ensure all connections are tight.
• Record the results. Pass / Fail
• Students shall be retested until a Pass is recorded.

General Instructors Tips:
1. Hands on Activity/Practical Skills Testing:
   a. Hands on Activity – these are instrumental to the development of the apprentices understanding of the material being taught.
   b. Practical Skills Testing – indicates if the apprentice has the sufficient skills necessary to be advanced to the next level/school year.
2. Components for Hands on Activity/Practical Skills Testing can be obtained through request to the IEC Foundation (check with your chapter ED).
3. Depending on your chapters resources/space you may need to adjust how you accomplish these activities/testing. (Training Directors your chapter/other chapters are a great resource.)