



## 2023 Instrumentation Fitting Competition

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### FACT SHEET

#### **Project Manager**

**Jason White, Cianbro Institute**

For questions related specifically to the instrumentation fitting competition, contact Jason White at [jwhite@cianbro.com](mailto:jwhite@cianbro.com). For all event questions, contact Jarrell Jackson, National Craft Championships director, at (202) 595-1789 or [jackson@abc.org](mailto:jackson@abc.org). **Note:** This competition is limited to five competitors.

#### **Specific Competition Eligibility**

The instrumentation fitter competition has no competition-specific eligibility requirements. Please refer to overall eligibility requirements listed on page 3 of the guidebook.

#### **Online Exam**

The online exam must be completed before competitors arrive on site, at a local NCCER Accredited Training Sponsor or Assessment Center. Accommodations will be made for extreme circumstances with prior approval of the NCC director. All competitors must sit for the online exam or face disqualification from the NCC. The online exam continues to make up 25% of one's overall competition score. It is the responsibility of the sponsor organization to schedule test sessions directly with NCCER. Test registration and guidelines will be available in January 2023.

#### **Practical Performance Test Description**

Each competitor will perform three tasks utilizing knowledge and skills applicable to mounting instruments, bending and installing tubing and installing tubing supports; terminating electrical instrumentation; and checking out and starting up of a system.

#### **Instrumentation Fitting Task: Tubing**

Each competitor will be issued a set of instructions and specifications, a P&ID of the system, an electrical ladder logic diagram and the schematic of a de-energized solenoid valve.

Working on a plywood wall, 7 feet by 6 feet, which has piping, tanks, conduit, float switches, wiring, unistrut hangers and valves previously attached, each competitor will mount three instruments according to the instructions and specifications. They will then install the appropriate size tubing and hangers according to the instructions and specification sheets, the schematic of the solenoid, the electrical ladder logic diagram and the P&ID.

#### **Instrumentation Fitting Task: Electrical Termination**

Each competitor will be issued a written set of instructions, specifications and a termination diagram for termination at the float switch, solenoid valve and relay/termination junction box.

Working on the same plywood wall, the competitor will properly terminate and label all wiring according to the instructions and termination diagram. The project manager will install all wiring in the conduit prior to the test. The competitor will install all covers, and the system will be ready for check out and start up.

### **Instrumentation Fitting Task: Check-Out and Start-Up**

Upon completion of the above tasks, each competitor will notify the project manager that they are ready for check-out and start-up. They will be instructed by the project manager to follow the written instructions provided in their package after the electrical judge has completed his/her inspection. The instrumentation judges will then perform their inspection. Upon completion of the instrumentation inspection, each competitor will be instructed to start the system for a function test. Once their part of the system has passed the function test, they will have completed the practical performance test.

### **Knowledge and Skills Required**

The knowledge and skills for this competition are based on all levels of the NCCER instrumentation fitting curriculum. It is strongly recommended that competitors have a working knowledge equivalent to a third-year apprentice.

### **Tools Required**

Each competitor should bring only the tools listed below to the competition. Tools will be inspected prior to the practical performance test. Points shall be deducted from the competitor's score for not having the required tools. Any additional tools will not be allowed in the competition area. Points will also be deducted from the competitor's score for any tools that are used by the competitor that are not called out in the specific task instructions.

- ½-inch tubing bender
  - 3/8-inch tubing bender
  - ¼-inch tubing bender
  - ¼-inch to at least 15/16-inch combination wrenches
  - Speed square or 2-foot square
  - Assorted straight and Phillips screw drivers
  - Non-programmable scientific calculator
  - One 8-, 10- or 12-inch adjustable wrench
  - Terminating screw drivers
  - Tubing cutter and reamer
  - Torpedo level
  - Tape measure
- Non-prescription eyewear may only be worn under safety goggles.
  - Wire strippers and crimping tool to be supplied by the project manager.
  - Contestants may use their own gloves, provided the project manager deems them safe to use.

The following is specifically **NOT PERMITTED**:

- Any instrumentation fitting reference materials

### Sample Score Sheet

The following sample score sheet is provided to give competitors an example of the criteria that may be included in the practical performance test. **However, this score sheet is only a sample and not intended to act as a study guide in preparation or to imply specific criteria that will be judged during the actual practical performance test.**

### ABC National Craft Championships Instrumentation Fitting Sample Score Sheet

	Competitor Identification Numbers					
	Maximum Points					
<b>Workmanship:</b>						
Plan work						
Neatness						
Bending accuracy						
Wiring technique						
Instrument mounting						
Effective use of material						
Clean-up after work						
<b>Layout:</b>						
Following instructions						
Ease of maintenance						
Interferences						
Supports						
<b>Checkout/Startup:</b>						
<b>Pneumatic –</b>						
Proper tube orientation						
Correct flow						
Leaks						
Gap inspection						
<b>Checkout/Startup:</b>						
<b>Electrical –</b>						
Wired correctly						
Labeled correctly						
Termination quality						
<b>SUBTOTAL:</b>	<b>160</b>					
<b>Safety:</b>						
Lock out/Tag out						
Hardhat						
Safety glasses						
Work shoes						
Gloves						
Proper tool use						
Housekeeping						
Hazard to others						
<b>SUBTOTAL:</b>	<b>40</b>					
<b>GRAND TOTAL:</b>	<b>200</b>					