

# SCOPE OF WORK

## REPLACE HVAC UNITS IB409 & IB410 - IB2

**Provide labor, materials, equipment, PPE and supervision to replace HVAC units IB409 & IB410 with ones of like kind with the same capacity, that is ASRAE 90.1 compliant, uses R-410A refrigerant and controls shall be compatible with BACNET/IP to communicate with Fermilab's Central Building Automation System (BAS).**

**The units are located on the IB2 addition roof.**

**IB409 - Trane Model# YCD090D4L0BD, Ser# K12101093D**

**IB410 - Trane Model# YCD060C4L0BD, Ser# K11100363D**

**Perform work on one unit at a time. One unit must always be operational.**

**Replace unit IB409 first.**

1. Create and maintain a safe work area using PPE, cones, warning tape and signage as needed.
2. Remove refrigerant from the unit. Must follow Fermilab's refrigerant program.
3. LOTO circuit #2/4/6 for unit IB409 and circuit # 7/9/11 for unit IB410 in panel LHP IBII-3 and disconnect power at the HVAC unit. Panel is located on the Ground Floor at the North end of the Shipping & Receiving area.
4. LOTO the natural gas supply line at the isolation valve located at the unit and disconnect piping from the unit. If the gas line needs to be re-worked before the valve, gas will need to be isolated at the meter which is located outside at the NE corner of IB2. Downtime needs to be minimized because isolating at the meter will shutoff flow to all 4 HVAC units for the IB2 West Addition. Make sure that the other units are purged and operating properly after gas pressure has been restored.
5. Disconnect controls wiring from the unit.
6. Disconnect unit from the duct work & roof and prepare unit to be removed from the roof.
7. Set up crane and provide rigging for removal of old HVAC unit and installation of the new HVAC unit. Task Manager will acquire the JULIE permit for the crane set-up location. Crane operator must have a City of Chicago Operator's License or a Local 150 card. Crane contractor must provide a Lift Plan and the plan needs to be approved before work can be scheduled.
8. Remove old HVAC unit from the roof and set on the ground. Fermilab will dispose of the units.
9. Install new HVAC unit on the roof. Including shipping, loading, unloading, rigging and complete installation of all accessories shipped loose for field installation, in accordance with the equipment installation manual, and standard industry practice.
10. Fabricate/modify and reconnect ductwork as needed.
11. Rework existing Natural Gas piping to connect to the new unit.

- a. If compatible, re-use the PRV. If not, install a new PRV.
- b. Install a pressure gauge downstream of the PRV.
- c. Gas piping shall be threaded black steel, sch 40.
- d. Use Locktite PST565 pipe sealant for threaded connections.
- e. Test gas piping for leaks.
- f. Test PRVs and adjust accordingly.
- g. Paint new & existing piping yellow.

**12. Reconnect electrical power.**

- a. Confirm that existing electrical is appropriate for the load of the new HVAC unit. If yes, reuse existing electrical conduit and wiring inside the building. If not, install new wiring and, if needed, new conduit.
- b. Provide and install separate 30 Amp, NEMA Type 3 rated disconnect switch with a viewing window.
- c. Verify that the circuit breaker is the correct size. If not, provide and install a new one.

**13. Install separate 120V GFCI receptacle for service power.**

- a. Provide and install new fused disconnect, transformer, and 120V GFCI duplex receptacle.
- b. All electrical components shall be outdoor rated or installed in an outdoor rated component.
- c. Power shall be supplied from the 480V feed before the disconnect.

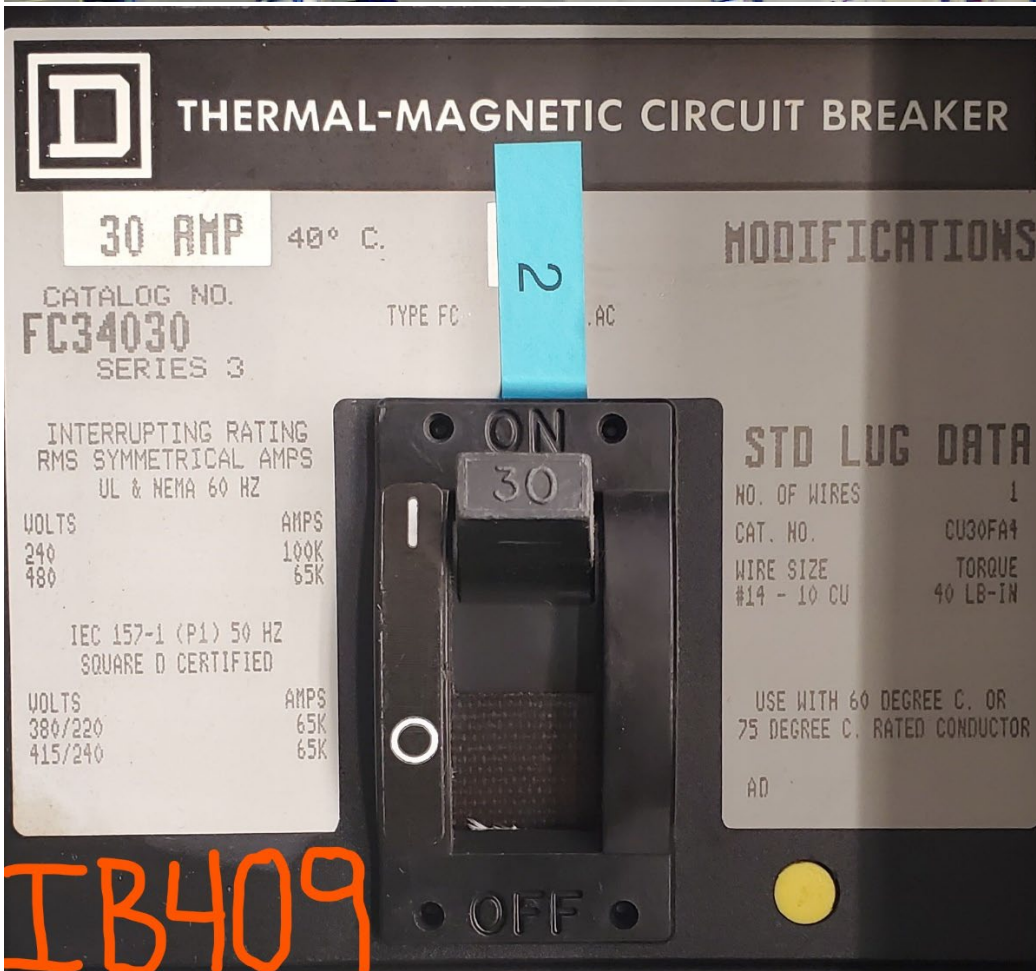
**14. Control System.**

- a. The controls of the unit shall be compatible with BACNET/IP to communicate with Fermilab's Central Building Automation System (BAS).
- b. If compatible, reuse the existing DDC thermostat. If not, provide and install a new thermostat that is compatible for the HVAC unit and DDC use.

**15. Commissioning.**

- a. Follow the manufacturers commissioning requirements and submit a final report to the Task Manager.

**16. Clean-up the work area. There shall be nothing left on the roof or ground after the completion of the project. All scrap metal will go in the scrap bin and all garbage will go in the construction dumpster. Both are located at the NW corner of IB3.**















# THERMAL-MAGNETIC CIRCUIT BREAKER

25A

FC34025

Type FC  
40 °C  
Series 3

7

INTERRUPTING RATING  
UL/CSA/NEMA 60 Hz  
Volts AIR  
240 AC 100kA  
480 AC 65kA

480 VAC

LUG: CU30FA4  
Wire Torque  
#14-#10 AWG Str/Sol Cu 35 lb-in

Use 60 or 75 °C Rated Wire

BREAKING CAPACITY  
IEC 157-1 (PD 50 Hz  
SQUARE D CERTIFIED

Volts AIR  
380/220 AC 65kA  
415/240 AC 65kA

LUG  
Wire Torque  
2.5-6 mm<sup>2</sup> Str Cu 4 N-m

AIOD

IB410

ON  
25  
OFF











# LHP-IBII-3 277/480V

8/4/14

|    |   |    |                      |
|----|---|----|----------------------|
| 1  | RTU-1 (South HiBay)                                 | 2  | RTU-2 (Center HiBay) |
| 3  |   | 4  |                      |
| 5  |   | 6  |                      |
| 7  | RTU-3 (North Mezzanine)                             | 8  | TR-IB2-5<br>75KVA    |
| 9  |   | 10 |                      |
| 11 |   | 12 |                      |
| 13 | SE-1 1HP Lift Station Outside<br>West of the Midway | 14 | 2- Welding recept    |
| 15 |   | 16 |                      |
| 17 |   | 18 |                      |
| 19 | L.D. NL Emrgcy Lts & exit                           | 20 | Crane                |
| 21 | 1 <sup>st</sup> floor lighting                      | 22 |                      |
| 23 | 1 <sup>st</sup> floor lighting                      | 24 |                      |
| 25 | 1 <sup>st</sup> floor lighting                      | 26 | Mezz. Floor Ltg      |
| 27 | Inst. Heater  | 28 | Mezz. Floor Ltg      |
| 29 | Inst. Heater  | 30 | spare                |
| 31 | Inst. Heater  | 32 | Spare                |
| 33 | Elect wallheater                                    | 34 | " "                  |
| 35 | Electr. Wallheater                                  | 36 | " "                  |
| 37 | Spare   | 38 | " "                  |
| 39 | Spare   | 40 | " "                  |
| 41 | Spare   | 42 | " "                  |
| 43 |   | 44 | " "                  |
| 45 |   | 46 | " "                  |
| 47 |   | 48 | " "                  |
| 49 |   | 50 | " "                  |
| 51 |   | 52 |                      |