

CABLE PRESSURE SYSTEMS

C AND D METER-PANELS

DESCRIPTION, USE, AND INSTALLATION

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1. GENERAL

- 1.01 This section covers the description, use, and installation of the C and D meter-panels and the associated piping and wiring arrangements in the central office (CO).
- 1.02 This section is reissued to correct references and Fig. 5, 9, 10, and 11.

**Reprinted to comply with modified final judgment.

1.03 The C and D meter-panels are a direct replacement for the B meter-panel, dual pressure kit (KS-16648), and the commercial Puregas Equipment Corporation 8541-A pipe alarm meter-panel. The superseded B meter-panel and 8541-A pipe alarm meter-panel, and the KS-16648 dual pressure kit are covered in Sections 637-225-050 and -205, respectively.

2. PURPOSE OF C AND D METER-PANELS

2.01 The primary purpose of the C and D meter-panels is to provide continuous pressure regulation and monitoring of the airflow to two CA-3131 feeder pipes so an alarm will be given in the event of:

- (1) Pipe failure
- (2) Plastic tubing failure in the cable entrance facility (vault) or at a manifold or high-valve manhole
- (3) Serious leakage occurring in an underground cable or an aerial riser cable.

2.02 The secondary purpose of the meter-panels is to provide a compact assembly of shutoff valves, air pressure regulator, air meter, pressure gauge, and alarm facilities for two specific pipe systems.

3. DESCRIPTION

C METER-PANEL

3.01 The C meter-panel, illustrated in Fig. 1, is designed for use with *manual monitoring systems* (without CPMS) to monitor the airflow to two CA-3131 pipes. The two pipes may feed two pipe systems or connect to C manifold(s) feeding individual cables at the cable entrance facility.

3.02 The C meter-panel utilizes a flow-switch arrangement to activate a CO alarm and an alarm lamp when the airflow rate exceeds 1200 standard cubic feet per day (scfd). Two alarm lamps are located on the meter-panel faceplate—one lamp for each pipe route. When this meter-panel is installed, cable or pipe deterioration (gradual increase of airflow) is denoted through a comparison of the recorded meter readings of the air usage (see Section 637-050-300).

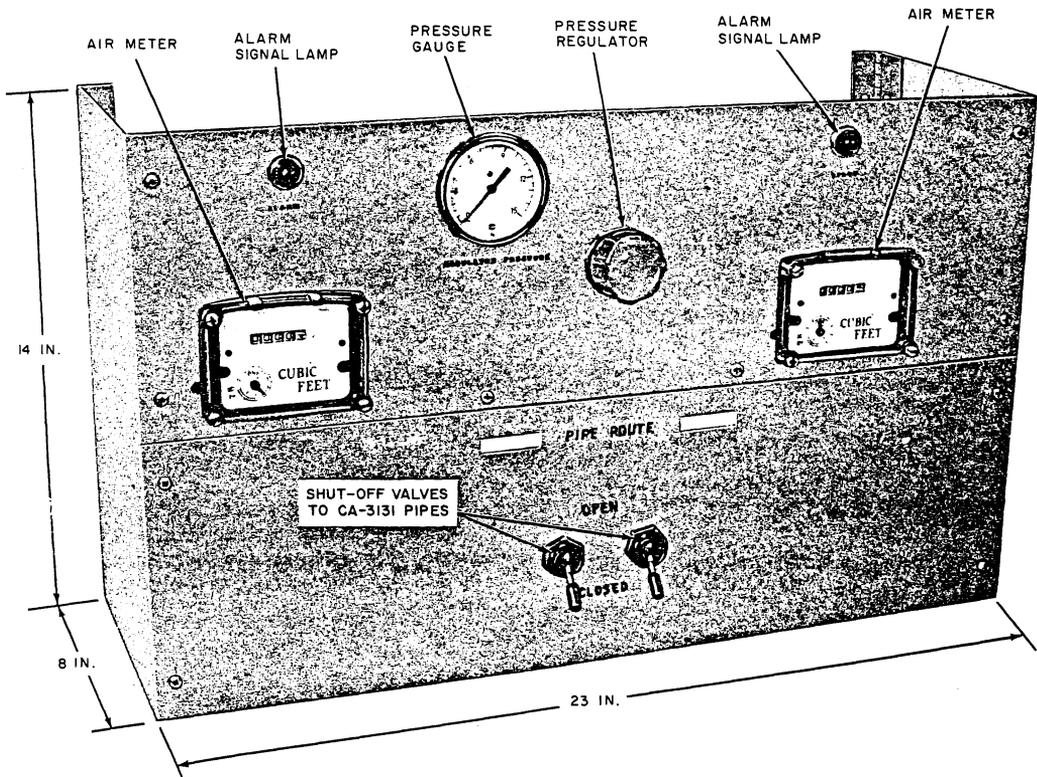


Fig. 1—C Meter-Panel—Front View

3.03 The components of the C meter-panel are mounted on a three-sided gray enameled sheet steel chassis. The lower front plate is detachable to provide access for making wiring and piping connections.

D METER-PANEL

3.04 The D meter-panel illustrated in Fig. 2 is designed for use with *automatic monitoring systems* (with CPMS). The D meter-panel is essentially the same as the C meter-panel, except

a B airflow transducer is utilized in lieu of the flow-switch arrangement to fulfill the alarm requirement. Alarm lamps are not employed since bulletins are issued by the CPMS computer when an alarm condition occurs.

3.05 Since the airflow switch arrangement is not included in the D meter-panel, connections for the CO alarm circuit are not required. However, facilities for connection of the B airflow transducers to the CPMS remote terminal are included.

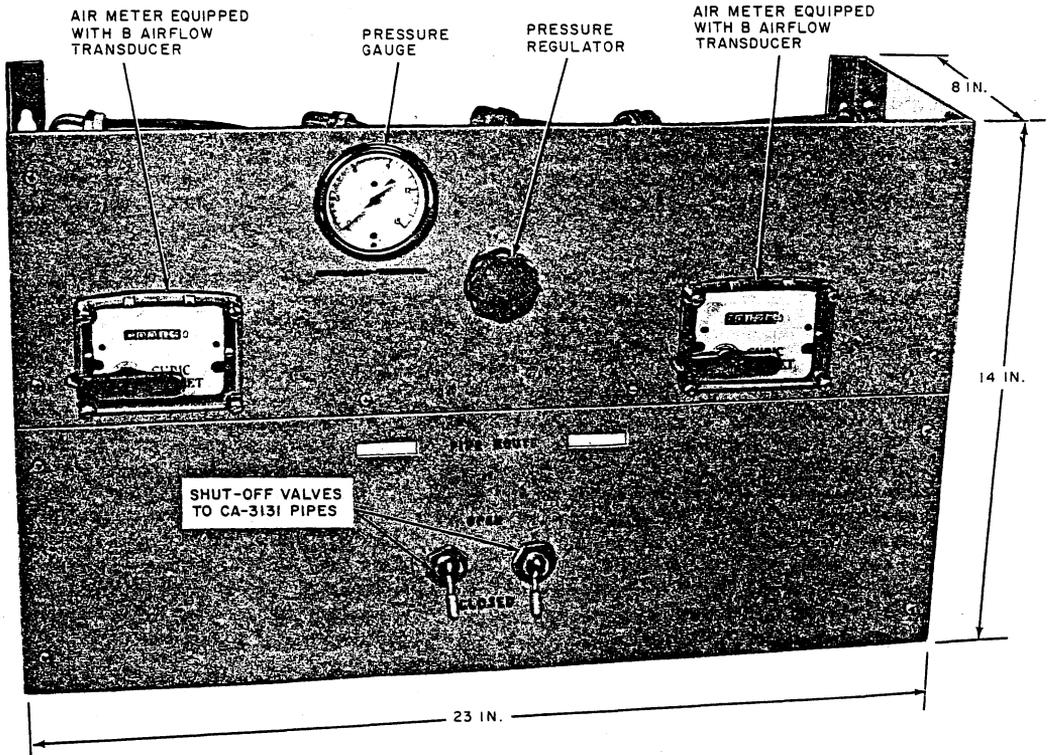


Fig. 2—D Meter-Panel—Front View

FUNCTION OF COMPONENTS (C OR D METER-PANELS)

3.06 The C or D meter-panels are arranged to receive:

- Copper tubing connection from the air dryer, or optionally, to receive the copper tubing connection from an adjacent meter-panel.
- Two CA-3131 air pipes. (Plastic pipe fittings for terminating these pipes are furnished.)
- Connections from the CO battery and alarm circuits (C meter-panel) or connections from CPMS (D meter-panel).

3.07 The principal components of the C and D meter-panels and their functions are as follows:

- **Shutoff Valves:** A shutoff valve to each pipe (Fig. 1 or 2) in conjunction with the pressure regulator permits rearrangements, replacement of components, etc, without affecting other cable or pipe routes.
- **Pressure Regulator:** The pressure regulator controls the air being delivered to the pressure systems. Normally, the regulator is set to limit the high-pressure air from the dryer to 10 psi.
- **Pressure Gauge:** The pressure gauge indicates the pressure of the dry air being delivered to the pressure systems.
- **Air Meter:** Each of the two air meters indicate, either visually (C meter-panel) or electronically (D meter-panel) the volume of air delivered to its associated pressure system in cubic feet at the delivered pressure. Detailed information concerning air meters is covered in Section 637-225-100.
- **Airflow Switch (C Meter-Panel Only):** Provides the facility for operating the alarm signal lamp and the relay which closes the circuit to the CO alarm when the flow rate exceeds 1200 scfd.

- **B Airflow Transducer (D Meter-Panel Only):** The B airflow transducer is used in conjunction with CPMS. The CPMS computer calculates the airflow rate and total air usage and transmits this information to the responsible maintenance center for analysis. A description of the B airflow transducer is covered in Section 637-225-215.

- **Alarm Signal Lamp (C Meter-Panel Only):** When illuminated, indicates that the airflow has increased to the alarm level. These lamps are independent of the CO alarm and will remain illuminated until the airflow alarm condition is corrected.

4. LOCATION OF METER-PANELS

4.01 The meter-panels should be located conveniently to the air source and in such a location that a minimum length of copper tubing is required between the high-pressure outlet of the air dryer and the meter-panel.

4.02 It is recommended that the meter-panel be located outside the cable vault. However, where the panels must be located inside a vault, they should be installed so the overall assembly does not interfere with future placing or racking of cables.

5. INSTALLATION PROCEDURES



To retain humidity and pressure alarm capabilities where only C or D meter panels are installed, one of the meter panels must be connected to the low pressure side of the air dryer. A minimum of 15 psi air must be supplied to this panel. All other C or D meter panels are connected to the high pressure side of the air dryer.

5.01 Panels may be stacked (mounted vertically) and/or banked (mounted horizontally) to best utilize the available space in the CO. Adjoining panels are connected structurally with stacking straps, as shown in Fig. 3.

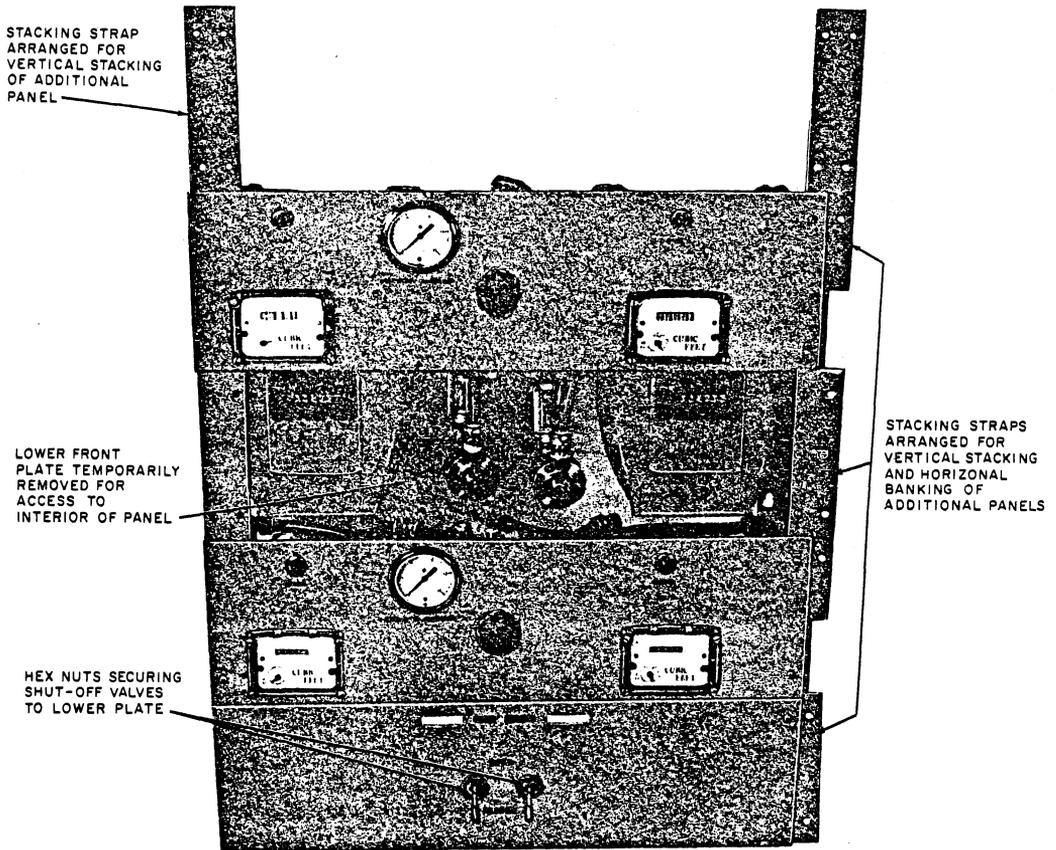


Fig. 3—Front View of Stacked C Meter-Panels

5.02 Four mounting holes are provided on the rear of the side plates for securing the panel to a wall, plywood backboard, or metal framework. A mounting template, mounting bolts, and stacking straps are included with each panel.

5.03 After the panels have been mounted, remove the lower front plate of each meter-panel (except bottom meter-panel(s)) to facilitate the

electrical and pneumatic connections required. The lower plate is removed as follows:

- (1) Remove the two hex nuts securing the two shutoff valves to the lower plate (Fig. 3).
- (2) Remove the four screws securing the lower plate to the frame and the two screws securing the lower plate to the upper plate (Fig. 3).

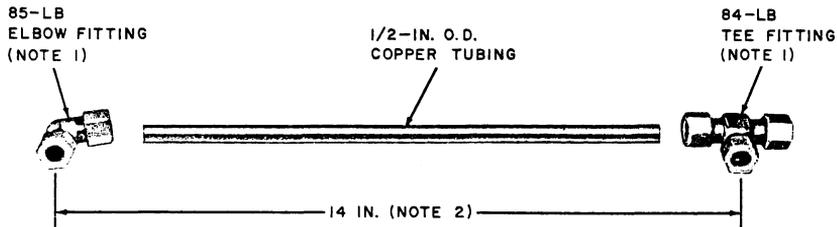
5.04 Meter-panels are connected to the air dryer and interconnected to adjacent panels with 1/2-inch od copper tubing. When panels are **stacked vertically**, an interconnection assembly must be prepared and installed for each vertical stack as follows:

- (1) Select a length of 1/2-inch od copper tubing, elbow fitting, and required tee fittings, and prepare as described in Fig. 4.

Note: Ensure that the elbow and tee fitting openings point in the same direction when secured to the copper tubing.

- (2) Install the interconnection assembly to the copper tubing extending from the pressure regulators at the rear of the meter-panels. The elbow fitting of the prepared assembly is connected to the pressure regulator of the bottom meter-panel, and the tee fitting(s) connect to the pressure regulator of each panel above the bottom panel, as shown in Fig. 5.

Note: If the fittings do not align with the pressure regulator ports, they may be loosened to allow installation.



NOTES:

1. IMPERIAL EASTMAN CORP.
2. FOR EACH PANEL INTERCONNECTED, THE LENGTH OF TUBING SHALL BE SUCH THAT WHEN ASSEMBLED THE DISTANCE BETWEEN THE CENTER OF THE FITTINGS WILL BE AS SHOWN.

Fig. 4—Interconnection Assembly

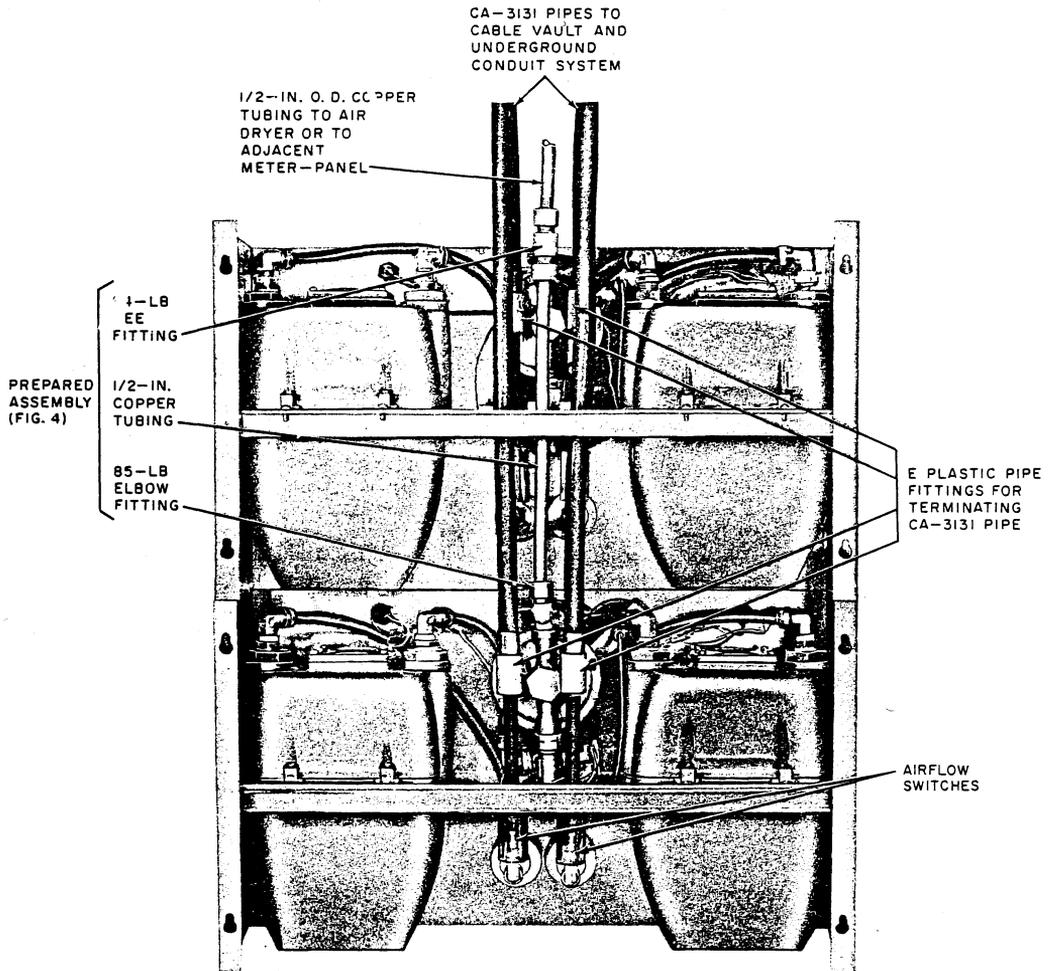


Fig. 5—Rear View of Stacked C Meter-Panels

5.05 When the meter-panels are banked *horizontally as well as stacked vertically*, the vertical interconnections are made as described in 5.04. The horizontal interconnections are made as shown in Fig. 6.

5.06 When meter-panels are installed *separately*, the connection to the pressure regulator port is made with an elbow fitting, as shown in Fig. 7.

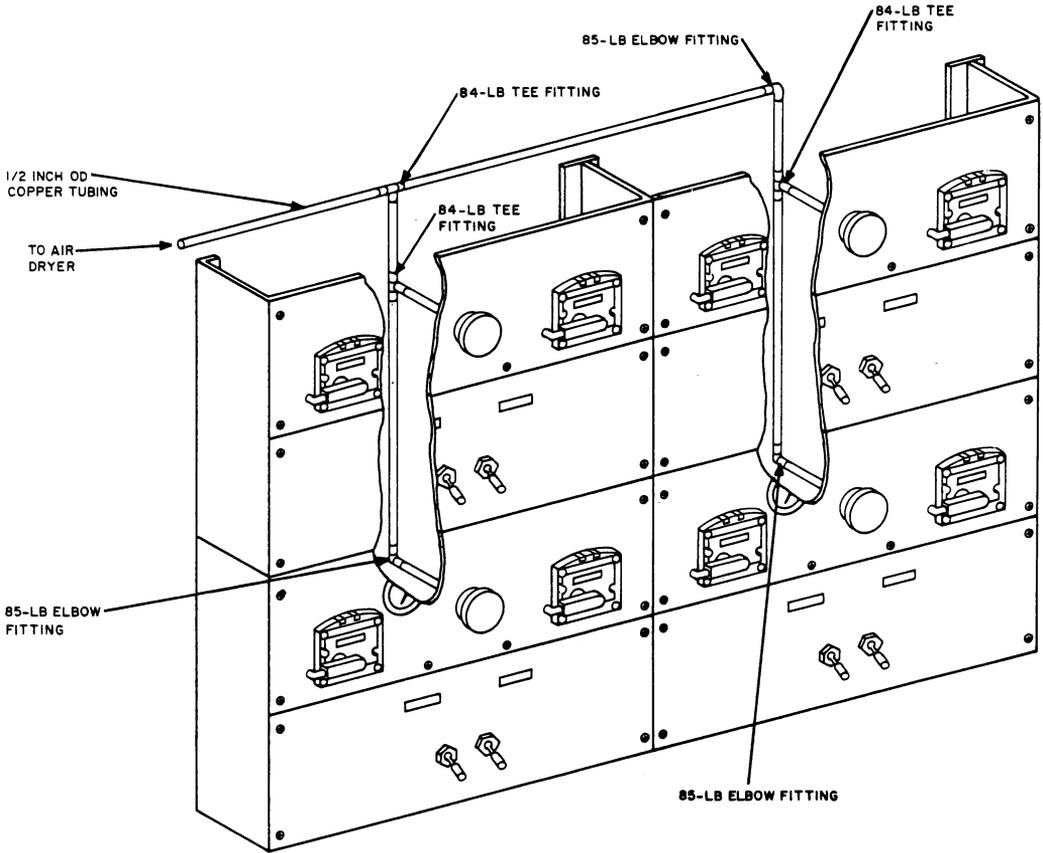


Fig. 6—Piping Arrangement for Horizontally Banked Meter-Panels

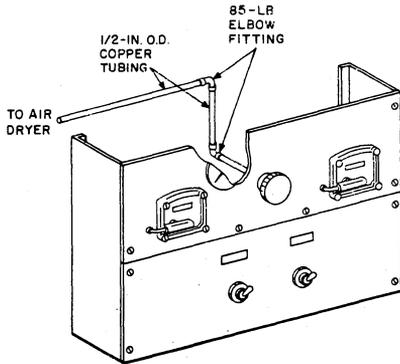


Fig. 7—Piping Arrangement for Separately Installed Meter-Panel

5.07 For *C* meter-panel installations, determine the CO battery and alarm circuits, the polarity of each, and terminate the conductors on the meter-panel terminal strip, as shown in Fig. 8.

5.08 When two or more *C* meter-panels are installed, connect the jumper wires from the terminal strip of the meter-panel connected to the CO battery and alarm circuits to the adjacent meter-panel, and from that panel to the next adjacent panel, etc.

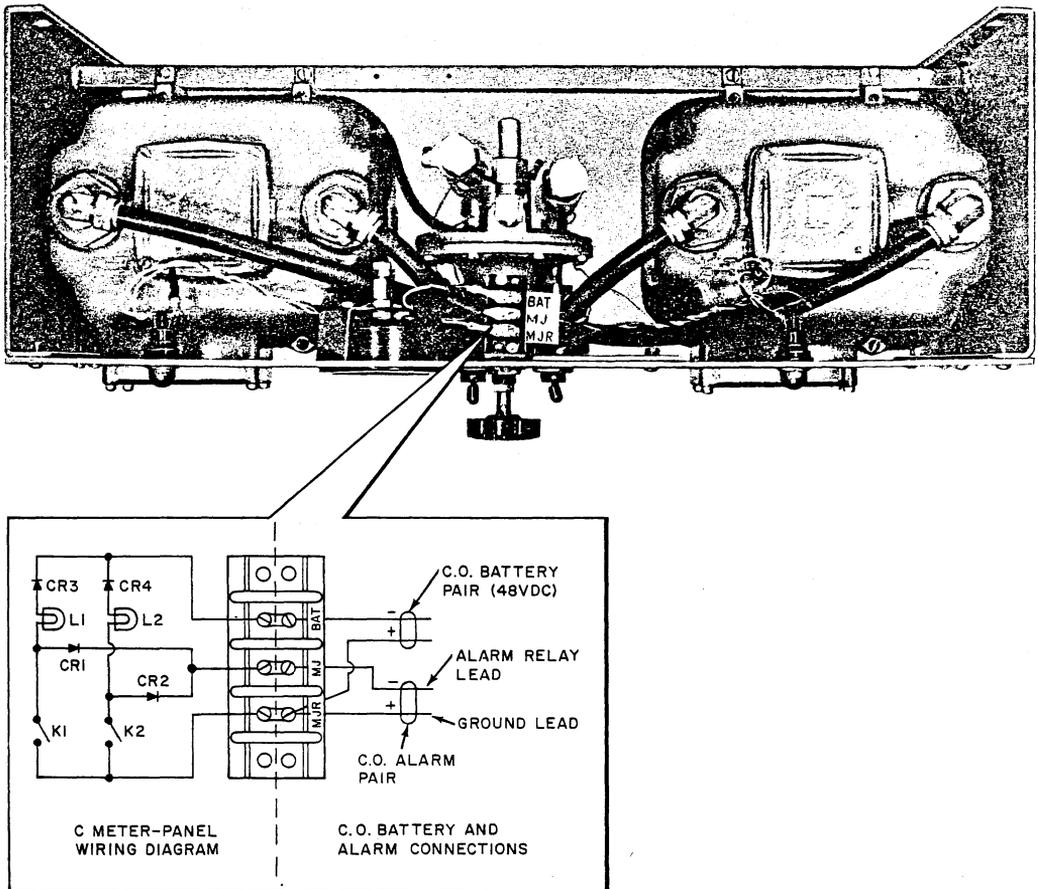


Fig. 8—*C* Meter-Panel—Top View (Wiring Diagram)

5.09 For *D* meter-panel installations, connect the *D* station wire from the *B* airflow transducer to the assigned terminals of a 66M1-50 connecting block or equivalent, which is associated with CPMS (Fig. 9).

5.10 Connect the CA-3131 pipe to the *E* plastic pipe fittings (furnished with meter-panel) of its assigned meter-panel section, as illustrated in Fig. 5. Arrangement of the pneumatic connection for the CA-3131 pipe in the vault is described in Part 6.

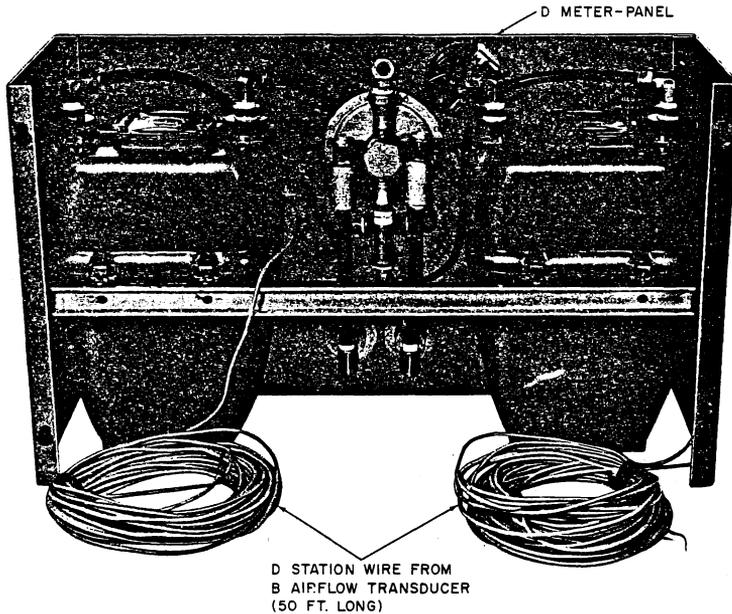


Fig. 9—D Meter-Panel—Rear View

5.11 Before pneumatically connecting the meter-panels to the air dryer, set the meter-panel controls as follows:

- (1) Close the pressure regulator for each meter-panel by turning the handle fully counterclockwise (Fig. 1 or 2).
- (2) Close the two outlet shutoff valves for each meter-panel (Fig. 1 or 2).

Warning: De-energize the air dryer power supply and move ON-OFF switch to the OFF position.

5.12 Connect a length of 1/2-inch od copper tubing between the high-pressure outlet of the air dryer and the tee fitting of the top meter-panel (Fig. 5).

Note: The low-pressure portion of the air dryer must be utilized in order for the air dryer to indicate a high humidity condition. If the installation has only C or D meter-panels, only one meter-panel should be connected to the low-pressure portion and regulated to a minimum of 15 psi.

5.13 When ready to provide dry air to the system, energize the air dryer power supply, place the dryer **ON-OFF** switch in the **ON** position, and set the meter-panel controls as follows:

- (1) Place shutoff valves which are pneumatically connected to the system in the **open** position.
- (2) Adjust the pressure regulator slowly by turning the regulator handle clockwise until a delivery pressure of 10 psi is indicated on the output air pressure gauge.

Note: The delivery pressure must be rechecked and adjusted, if necessary, during the initial charging period and when additional cables are pneumatically connected. Excessive airflow will activate the alarm and lamp on the meter-panel during the charging period until flow is stabilized.

- (3) Follow the procedures outlined in Steps (1) and (2) above for the remaining meter-panels.

5.14 If it is desired to test the alarm, a major leak may be created by pulling the tubing from an appropriate fitting in the cable vault or by opening the appropriate outlet valve before connecting the CA-3131 pipe.

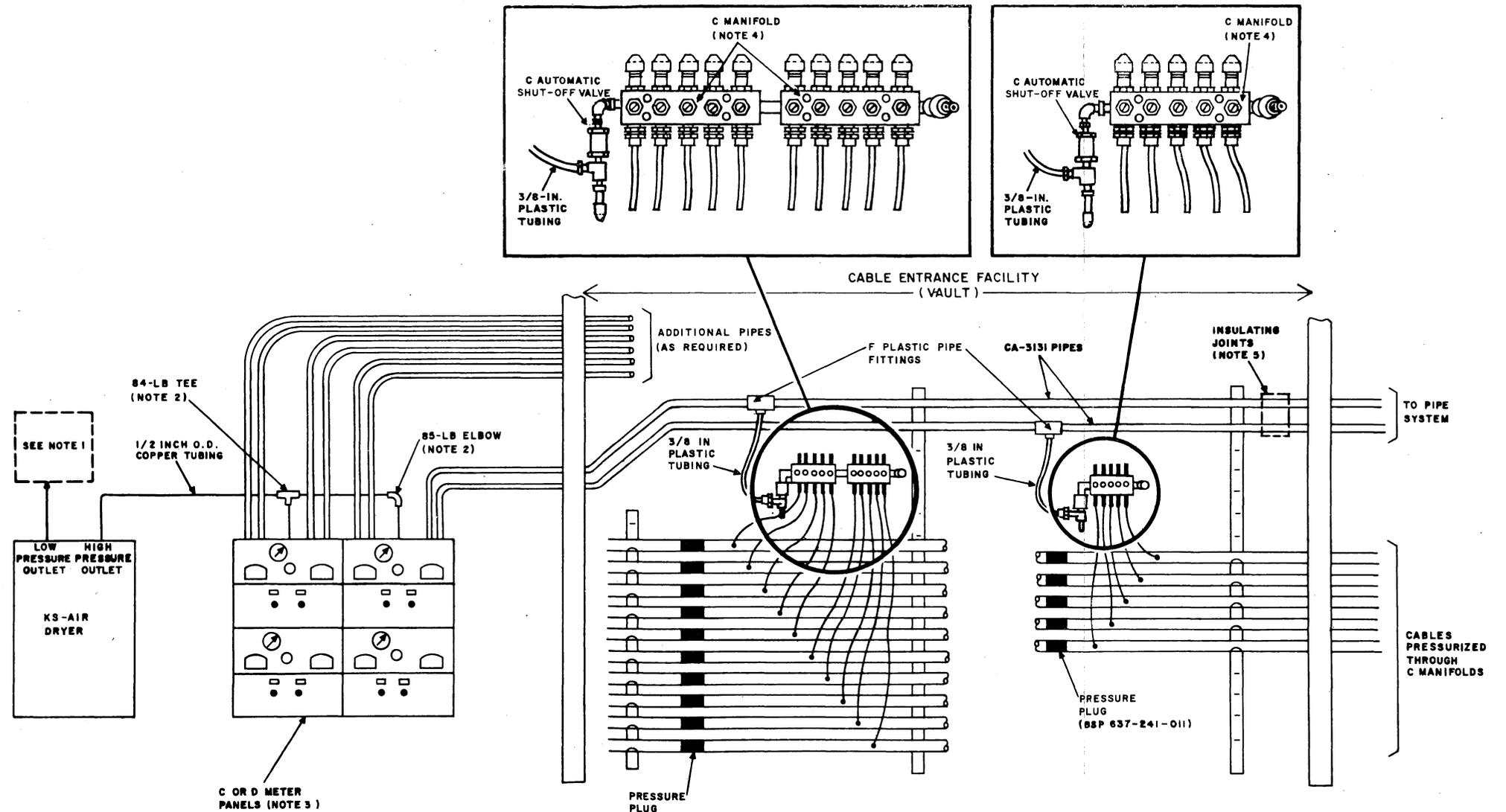
6. INSTALLATION OF CA-3131 PIPE

6.01 The CA-3131 pipe between the meter-panel and the connections in the vault should be installed with consideration given to the following:

- (1) It should be located where physical damage is unlikely.
- (2) It should be supported to eliminate sag, and excessive pressure at clamps should be avoided.
- (3) Holes in the cable vault wall should be made according to accepted practices, and should be located to avoid future cable locations.

6.02 Figure 10 illustrates the overall meter-panel installation with details for connecting the CA-3131 pipe to the individual cables to be pressurized.

6.03 Figure 11 illustrates the overall CO piping arrangement when both superseded and standard meter-panels are installed in the same office.



- NOTES:
1. TO MAINTAIN HUMIDITY AND PRESSURE ALARM CAPABILITIES, THE LOW PRESSURE OUTLET OF THE AIR DRYER MUST BE UTILIZED AT A MINIMUM OF 15 PSI TO SUPPLY AIR TO ONLY ONE METER-PANEL.
 2. IMPERIAL EASTMAN CORP. FITTINGS (637-235-100).
 3. SELECTION OF METER PANEL DEPENDS UPON TYPE OF MONITORING SYSTEM USED AS DESCRIBED IN PART 3.
 4. THE C MANIFOLD MAY BE WALL MOUNTED OR ATTACHED TO THE CABLE SHEATH, ALSO AN ADDITIONAL C MANIFOLD MAY BE COUPLED (AS SHOWN) TO PROVIDE FACILITIES FOR A MAXIMUM OF 10 CABLES PER CA-3131 PIPE.
 5. PIPE ARRANGEMENT WHERE INSULATING JOINT IS REQUIRED IS COVERED IN SECTION 637-050-200.

Fig. 10—Overall Installation Arrangement

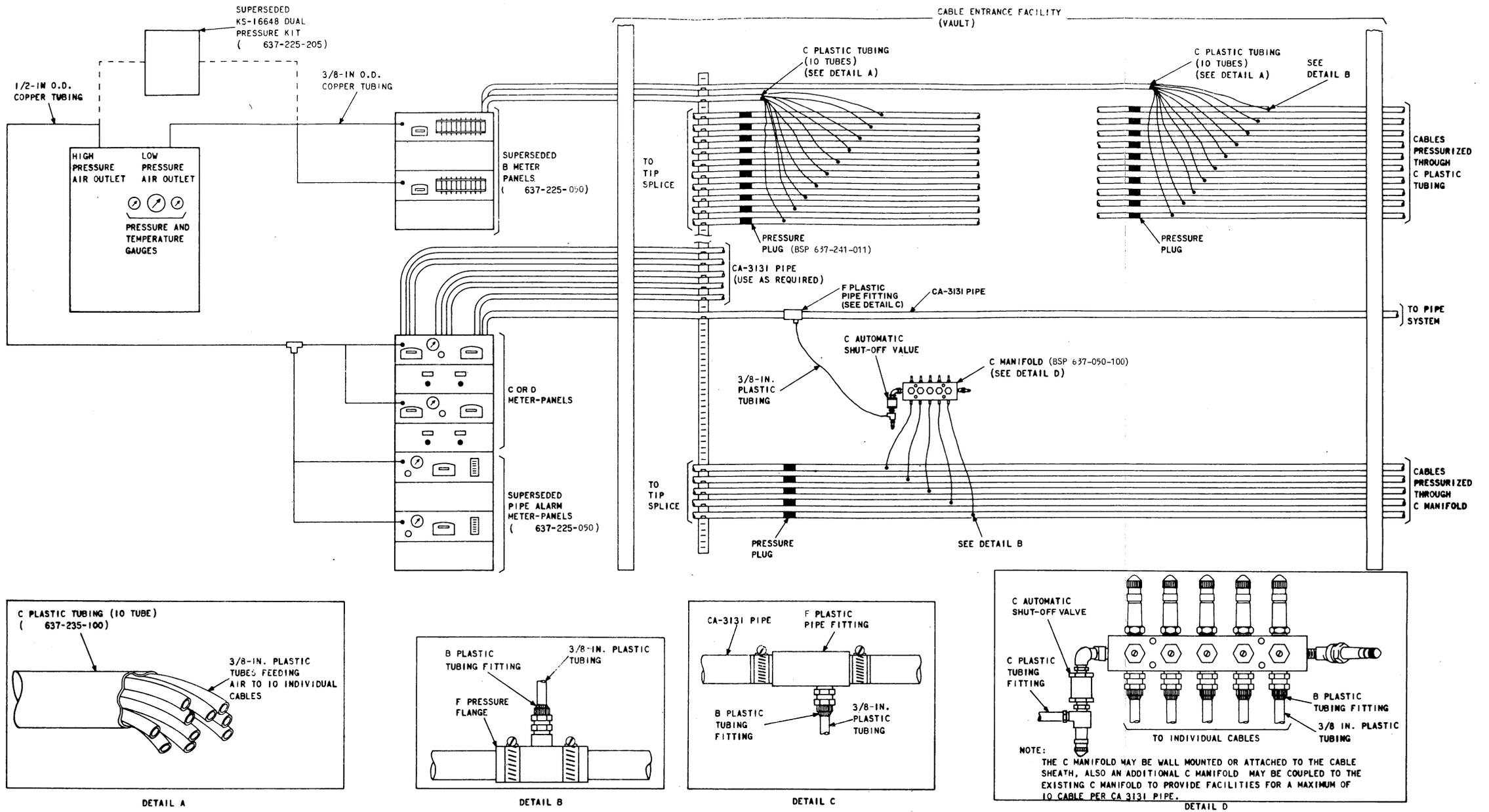


Fig. 11—Central Office Piping Arrangement