

## Emergency Air Dryer Protection System

---

---

*System-wide  
Air Pressure  
Protection  
Insurance*

Never in the history of telephone operating companies (telcos) has there been such high potential for catastrophic failure of a wire center. In addition to the normal concerns of fire and flooding that telcos have faced over the years, the impending possibility of terrorist activity and its devastating consequences make these concerns even more relevant. Significant damage to a central office building could literally shut down a wire center for days or months.

While not necessarily high on the list of considerations when evaluating the impact of a catastrophe or for contingency planning, a major concern to the telephone companies should be the system-wide cable pressure supplied by the central office air dryer/compressors. The loss of this system pressure could result in 50 to 100 major cable failures if the underground plant were to be left unpressurized for a day or more.

**How can this happen?** Easy, if an incident were to occur where access is denied to the wire center or the surrounding two or three city blocks, multiple cable failures could occur.

**The solution?** An emergency air dryer system to supply pressurized air to the cables in the wire center. This dryer could be located 1,000 to 2,000 feet away from the central office.

**The benefit?** Cost effective, easily implemented, long term cable pressurization system insurance against catastrophic failure of a wire center. With only minimal hardware requirements for each wire center, and the purchase of an emergency air dryer for use locally among multiple wire centers, telcos can be prepared for a swift response to possible disasters that could occur in a central office or surrounding areas.

### System Requirements

---

In order for the new system to provide telcos with the type of emergency cable pressurization system protection needed during a crisis situation in the central office, it must meet the following minimum criteria:

1. Offer a method of delivering dry air to the central office at up to 60 pounds per square inch (PSI).
2. Be easy to install by technicians in an emergency situation without the need for special training or the involvement and coordination of multiple crews.

3. Be fool proof enough that it can sit idle for three or more years without requiring maintenance, and be completely functional and dependable when needed.
4. Provide a cost effective solution for ensuring ongoing, system-wide protection.

## System Components

---

The important components that comprise the new Emergency Air Dryer Protection System are described below and illustrated in Figure 1. Please note that a standard telco air compressor must be used with the Emergency Air Dryer to fulfill the high delivery pressure (psi) requirement of the system:

### Emergency Air Dryer

#### *Air Dryer*

- This unit is a self-contained air dryer (not an air compressor) that does not require electrical pairs. It is used to extract moisture from the telco-supplied compressor, such as an Ingersoll-Rand, that is set up during an emergency at the manhole where the Emergency Air Feeder Assembly (Figure 2) is installed.
- Air dryer outputs up to 240,000 Standard Cubic Feet per Day (SCFD) are available, but the actual size (output) of the dryer can be specified when ordering.
- It utilizes membrane technology—the only maintenance required is the changing of pre-filters after a period of extended use.
- It weighs under 80 pounds—can be handled by one person.

#### *Delivery Pipe*

**One Inch Air Pipe** This high-impact plastic air pipe delivers pressurized air from the emergency air dryer back to the pipe panels and distribution panels in the central office.

#### *Assemblies*

### Emergency Air Receiver Assembly

- The Emergency Air Receiver Assembly (Figure 3) is a variation of the Emergency Air Feeder Assembly (described below). It is designed to be installed in the central office near the distribution panels.
- It includes a check valve to prevent leakage should the one inch pipe break.
- It contains a 3/8 inch tubing feed from the distribution panel to pressurize the one inch air pipe when it is not in use.
- It is supplied with a 20 Standard Cubic Feet per Hour (SCFH) flow restrictor on the 3/8 inch tubing to prevent a major central office drain should the pipe break.

**Note:** The one inch air pipe will be monitored by the distribution panel that is feeding the air receiver. A break in the pipe will generate a significant flow increase at the flow transducer monitoring the panel.

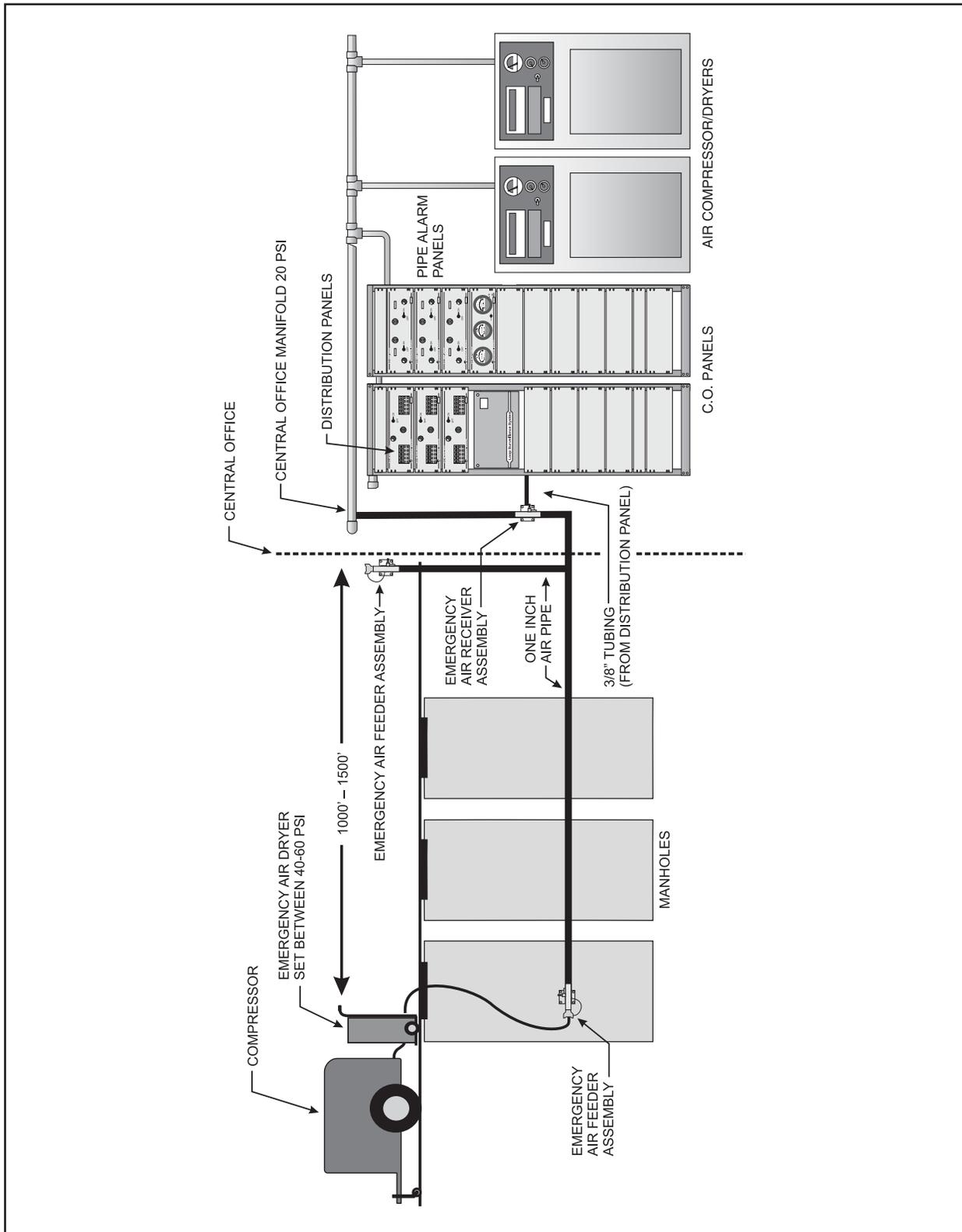


Figure 1—System Schematic

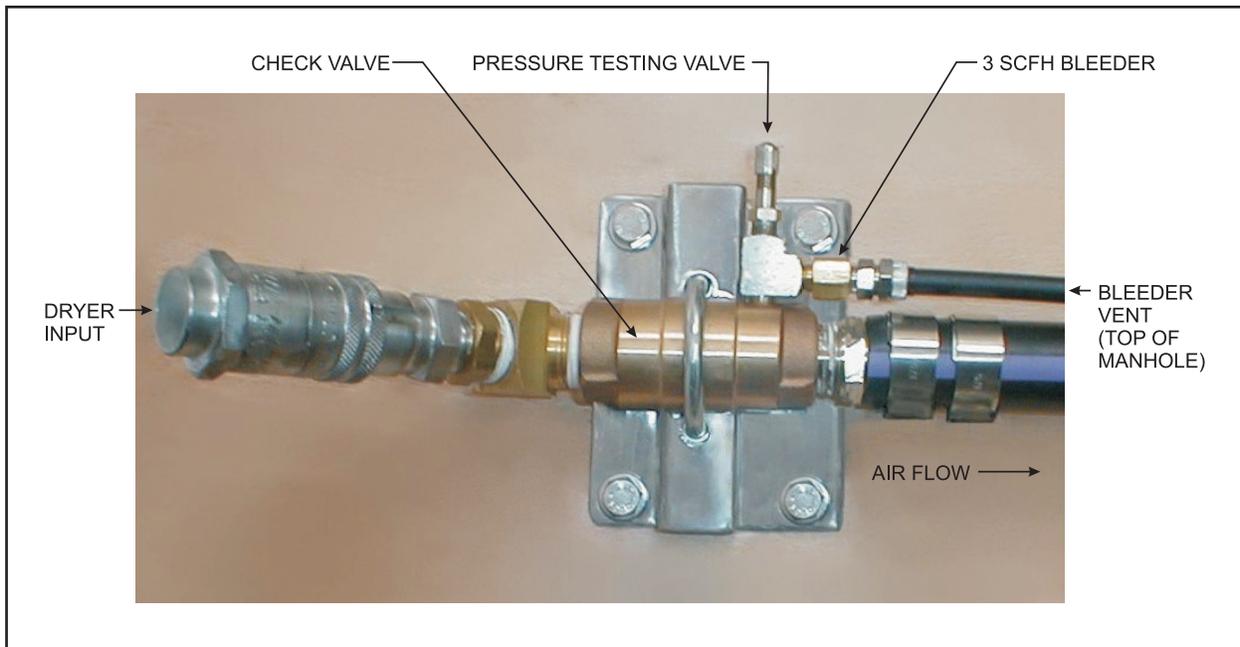


Figure 2—Emergency Air Feeder Assembly  
(Part No. 9800-0901)

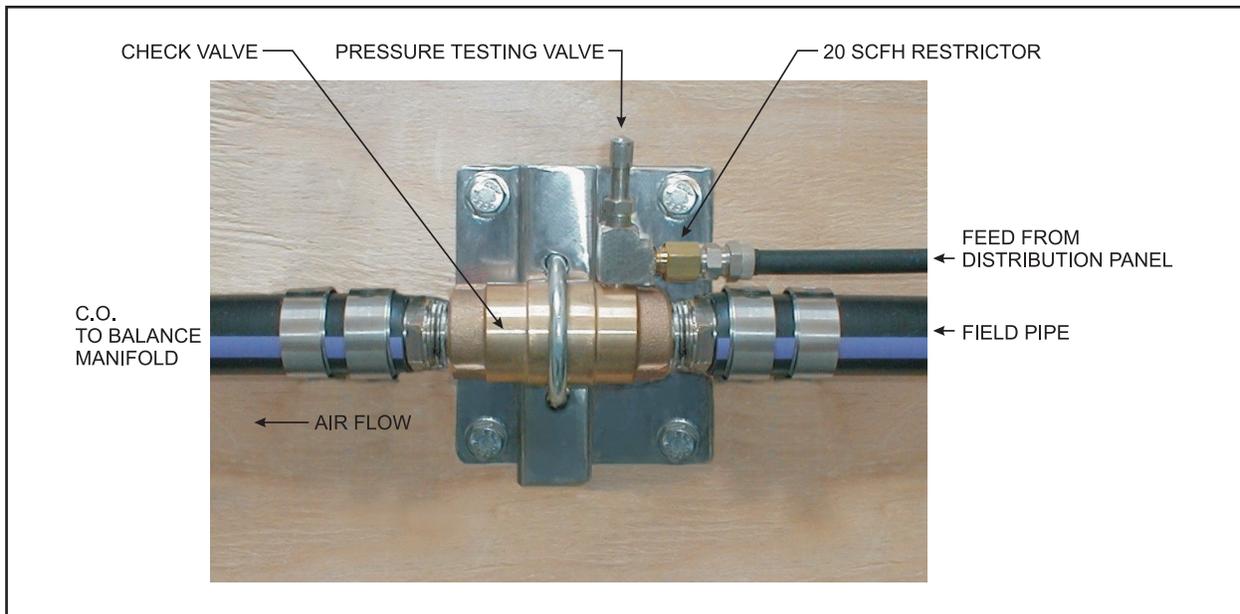


Figure 3—Emergency Air Receiver Assembly  
(Part No. 9800-0902)

### Emergency Air Feeder Assembly

#### *Designed for Multiple Locations*

- This unit (shown in Figure 2) is installed in the manhole selected for the placement of the air compressor and emergency air dryer.
- It includes a unique hookup for the air dryer, which prevents other equipment (air sources) from being connected.
- It also contains a check valve to prevent bleeding of the pipe (loss of pressure) when the dryer is not in use.
- It utilizes a 3 SCFH bleeder orifice to allow minimal air flow, which keeps the pipe dry when not in use.

*Note:* As shown in Figure 1, another Emergency Air Feeder Assembly can be installed outside the central office in order to supply air to the office during routine dryer maintenance.

### System Installation

As a safeguard against potential catastrophe, one emergency air dryer would be required per city or area, and stored at a centralized location—such as a telco garage—where the unit can be transported in a timely manner.

#### *Selecting a Suitable Site*

A suitable manhole should be selected for the installation of the Emergency Air Feeder Assembly. This manhole must have conduit available from the central office vault in order to accommodate the placement of the one inch air pipe. The manhole also needs to be kept dry to eliminate the need for pumping, which could significantly delay access to the hole—especially if water from adjacent manholes contributes to the volume. Finally, the manhole needs to be located away from major traffic routes to ensure quick access during an emergency, and there should be space available near the entrance to the manhole for parking a telco truck and setting up the compressor (Figure 1).

#### *Air Dryer Output*

The output delivery pressure of the dryer should be regulated, based upon the flow rate of the office in SCFD and the distance the manhole is located from the central office. Higher flow requirements and greater distances between the dryer and the central office require increased delivery pressures. Ideally, a pressure of 20 psi should be achieved in the central office.

With the necessary equipment in place in each office, and the availability of an Emergency Air Dryer for a designated area or city, response to an emergency situation that disables a central office can be accomplished within a relatively short period of time. The equipment can operate in this capacity to protect the pressurized cable system until the necessary repairs are made to the dryer equipment in the central office.

For additional information about the design and implementation of the Emergency Air Dryer Protection System, please contact System Studies Incorporated.

**System Studies Incorporated**



2-1340 East Cliff Drive  
Santa Cruz, CA 95062  
(831) 475-5777  
(800) 247-8255  
(831) 475-9207 FAX  
[www.airtalk.com](http://www.airtalk.com)