

# COPPER OIL PIPELINES

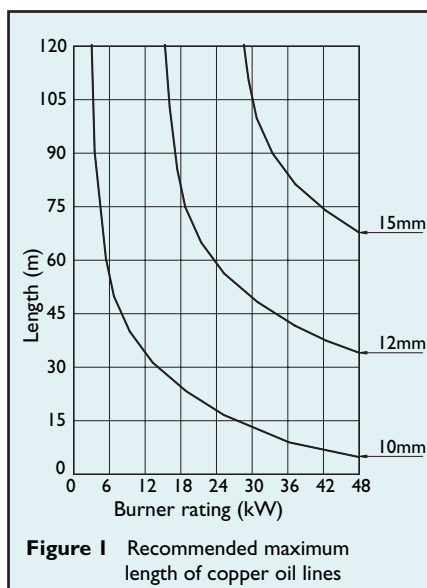
Copper's neat unobtrusive appearance, flexibility, ease of jointing and high degree of fire resistance make it an ideal material for oil pipelines.

## Tube and fittings

Supply pipes for small oil boilers are usually installed using 10, 12 or 15mm diameter EN 1057 half-hard thick wall, formerly Table Y copper tube. Also, EN 1057 thin wall formerly Table X tube can be used for surface fixed applications. Joints are made using flared type EN 1254 manipulative (type 'B') compression fittings. These are used because of their superior strength. Threaded ends of fittings for connection to pipeline components such as valves and filters should be sealed using petroleum resistant jointing compound or PTFE tape.

## Tube diameter selection

The diameter of tube required to feed a particular installation depends on the relative height of the storage tank to the burner, the length of run of tube and the quantity of oil required. Figure 1 illustrates the relationships, and can be used to select a suitable tube diameter by reference to burner power in kW's and length of tube. It is based on a



minimum head of 300mm of oil above the burner for gas-oil, which has a viscosity of 35 seconds Redwood scale (commercial kerosene, viscosity 28 seconds, will give a slightly increased flow rate).

## TYPES OF SYSTEM

### Single pipe system

Where the storage tank can be located above the level of the burner, a single pipe gravity fed system can be used. In this case the bottom of the tank should be at least 300mm above the

level of the burner to give sufficient static head. Vaporising burners that use an oil level control also often require that the tank is not too high above the burner; the maximum is usually 3m. A typical single pipe system with its ancillary components is shown in Figure 2.

### Two pipe system

Pressure jet oil burners incorporate an oil pump that can be used to lift the oil up to the burner in installations where the tank is situated below the burner. This is achieved by using a two pipe system. Alternatively, a single pipe system and de-aerator device can be used. The two pipe system is shown in Figure 3. The non-return valve fitted into the supply pipe is necessary to prevent oil from running back into the tank when the burner stops. Without the NRV the burner would become unprimed and then fail to re-ignite causing lock-out. Bleeding and priming of the oil line would then be required before the burner would run properly.

**Note:** if the top of the tank is above the level of the burner a second non-return valve is also needed to prevent oil from siphoning out of the tank along the return line during burner maintenance.

### Single pipe system with de-aerator device

If a single pipe system and de-aerator is used then the de-aerator must be fitted close to the burner. Any air that is drawn along the single pipe between the tank and the de-aerator is bled off by the device. It is connected to the burner oil pump using flow and return pipes as shown in Figure 4.

### Pipe installation

When installing the oil pipe(s) arrange for a slight rise in the direction of flow, approximately 1:600 will be sufficient. This is to facilitate air venting. If

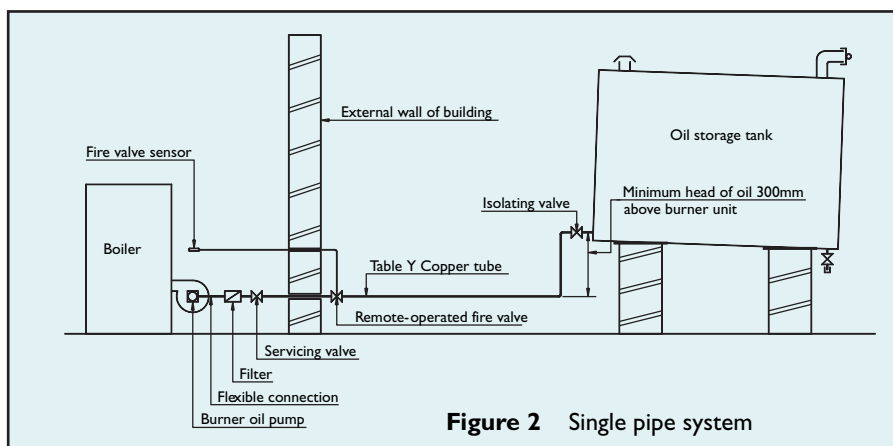
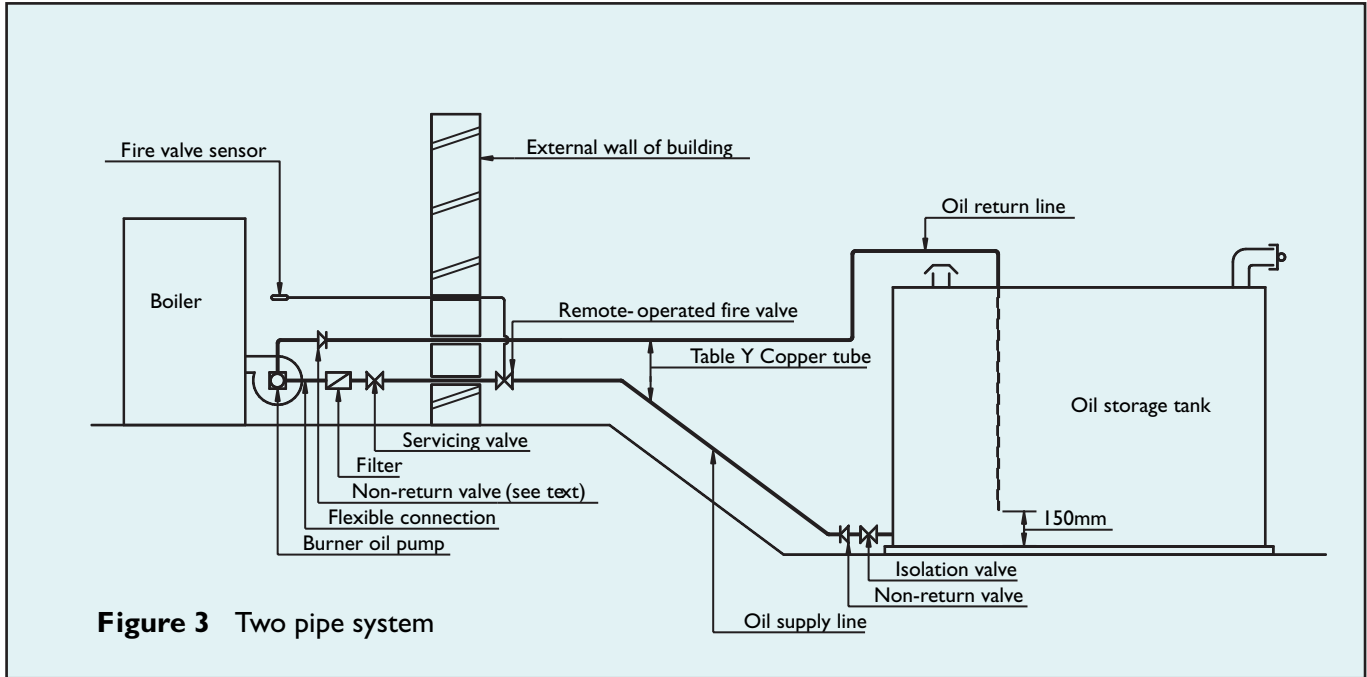


Figure 2 Single pipe system

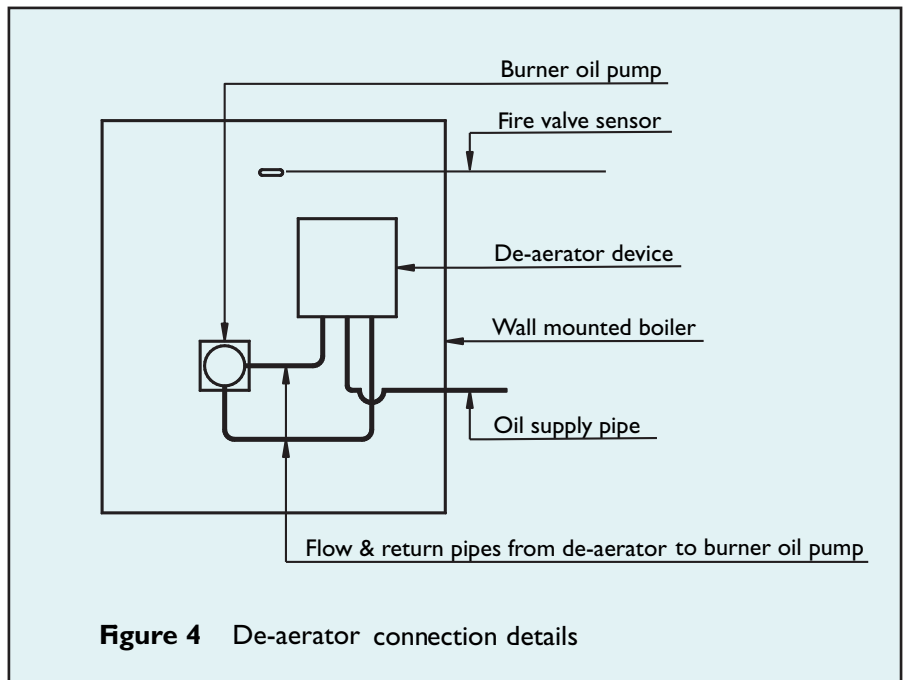


**Figure 3** Two pipe system

the oil pipe is to carry gas-oil then consider insulating the pipe, or even electrical trace heating in very exposed situations, to prevent waxing. Waxing can quickly clog filters in very cold weather, and is a danger if summer grade fuel remains in the tank. If the oil pipe is to be buried then ensure that it is deep enough to provide sufficient cover to minimise the risk of damage by, for example, garden digging. In general, it is prudent to ensure that underground sections are suitably protected with a factory applied plastic covering.

**Pipeline components**

Use a full way gate valve as the tank isolation valve and fit it as close as possible to the tank. An oil filter (disposable paper element type) should always be fitted in the pipeline. This can be fitted close to the tank or close to the burner. Composite tank fittings are available that comprise an isolation valve, filter and tank contents gauge (sight glass) in one unit. A remote operated fire valve is an important part of the installation. It should be installed outside the building. The fire valve is activated by a remote sensor that is located over the burner. Take care not to kink or damage the capillary connecting tube during installation. Although it requires slightly more work to install, a remote fire valve is better than using a fusible head valve, which has to be installed close to the burner, because it cuts off the supply outside the building in the event of a fire.



**Figure 4** De-aerator connection details