

## **Operating Instructions – Pipe Freezing Kit Model PFK-200**

### **GENERAL:**

2LBin.com PFK-DBL-5-3 pipe freezing kit for double freeze applications uses liquid Carbon Dioxide to freeze stationary water in pipes. Very low "dry ice" temperature (-109°F/-78°C) inside the freezing jacket creates a secure ice plug within the pipe and blocks the flow of liquid allowing repairs or modifications to be made to the piping system without draining or shutting down the entire system. Six freezing jackets for 1/2" through 4" pipes are supplied with the PFK-DBL-5-3 Double Freeze Kit. The pipe freezing technique can be used on iron, lead, steel, copper and plastic pipe.

The PFK-DBL-5-3 Pipe Freezing Kit can be supplied with an empty 20-60 pound CO<sub>2</sub> cylinder and if so, it must be filled before initial use. Check for a local CO<sub>2</sub> supplier for "Welding Equipment and Supplies".

**NOTE:** the PFK-DBL-5-3 will work only with the supplied tanks or similar tank fitted with a siphon. A cylinder without a siphon will not feed liquid CO<sub>2</sub> - CO<sub>2</sub> gas will not freeze the pipes.

### **GETTING READY:**

1. Prepare the pipe to be frozen as follows:
  - a. Stop the flow of water through the pipe. Moving water will not freeze.
  - b. Water temperature should be at room temperature (75°F/24°C) or colder whenever possible. Warmer water takes much longer to freeze and hot water will not freeze.
  - c. Thoroughly clean the section of pipe to be frozen. Dirt and layers of paint will lengthen the freezing process.
2. Check all hoses, freezing jackets, threaded parts and nozzle for wear and replace any worn components. Make sure the nozzle is clean and clear.

### **FREEZING PIPES**

1. Select the proper size freezing jacket based on the size of the pipe to be frozen.
2. Connect nozzle assembly to jacket making sure that the nut inside of the brass grommet on the jacket is tightened securely to prevent leakage.
3. Connect hose to the nozzle assembly and to the CO<sub>2</sub> cylinder and tighten securely to prevent leakage.
4. While holding the jacket firmly to prevent the nozzle from whip lashing, briefly open the valve on the cylinder to make sure the nozzle is clear.
5. Determine the correct freeze location taking into account the following points:
  - a. Always keep the freezing point 3 feet or more from a closed valve or connection.
  - b. Always keep the freezing point 3 feet or more from another freeze.  
**NOTE:** failure to observe this 36 inch margin of safety can result in damage to pipe due to the expansion of water as it freezes.
  - c. If torch cutting, welding or soldering is to be performed on the pipe, keep the freeze at least one foot from work for each inch of pipe diameter when working on carbon steel or iron pipe. Triple the distance on copper pipe. Cutting, welding or soldering too close to the freeze can damage the ice plug.
6. Wrap the freezing jacket around the pipe using the Velcro strips to seal the jacket in place and tie the cords tightly around the ends of the jacket. After this step, the use of protective gloves and safety glass provided in the kit is recommended to prevent frostbite.
7. Completely open the valve on the CO<sub>2</sub> cylinder.

8. Squeeze the jacket while injecting CO<sub>2</sub> to form a solid, even block of dry ice around the pipe. Crush any lumps that form in the ice using a rubber mallet.
9. The following chart applies to freezing completely stationary, 70°F water in carbon steel pipe. Adjust times according to actual conditions, allowing more time for warmer water or slight flow of water.
10. Multiply all times by 3 for plastic pipe.

JACKET SIZE		SMALL		MEDIUM		LARGE		
Pipe Size		1/2"	3/4"	1"	1 1/2"	2"	3"	4"
Injection		1 Min.	1.5 Min.	2 Min.	3 Min.	5 Min.	6 Min.	7 Min.
Waiting Time		3 Min.	5 Min.	5 Min.	5 Min.	5 Min.	8 Min.	11 Min.
# Of Injections		2	2	3	4	4	6	7
Total Time		8 Min.	13 Min.	21 Min.	32 Min.	40 Min.	84 Min.	126 Min.
CO <sub>2</sub> Consumption	Single	1 1/2 Lbs.	2 lbs.	4 lbs.	10 lbs. *	22 lbs. *	40 lbs.*	75 lbs.*
	Double	3 Lbs.	4 lbs.	8 lbs. *	20 lbs. *	44 lbs. *	80 lbs.*	150 lbs.*

- ❖ Keep extra filled CO<sub>2</sub> cylinders on hand. Have at least 2 full cylinders available when freezing 2-inch pipe and 3-4 full cylinders for 3 till 4 -inch pipe. All cylinders must be equipped with a siphon and must be kept upright when in use. For double freeze jobs keep double the amount of CO<sub>2</sub> cylinders.
  - ❖ A full 20 pound CO<sub>2</sub> cylinder contains about 18 pounds of usable CO<sub>2</sub> and weights 45 Pounds. An empty cylinder weighs 27 pounds. Weight the cylinder between freezes to determine its approximate content.
11. If you are unable to form a solid dry ice pack, check the nozzle for blockage, make sure the CO<sub>2</sub> cylinder is not empty, and make sure the water flow in the pipe is turned off.
  12. Continue shaping the dry ice pack at 10 minutes intervals during the freezing process. For optimum results, keep the ice pack formed tightly around the pipe using a rubber mallet.
  13. When the injection process is completed, frost should be formed on the outside of the pipe at the edges of the jacket. This indicates that the contents of the pipe are completely frozen. As long as this frost remains dry and stable, the freeze is being properly maintained.
  14. Leave the freezing jacket on the pipe while performing pipe maintenance.  
**As a safety precaution, make additional 30-second injections every 15 minutes.**
  15. When work is completed, remove the freezing jacket from the pipe and allow the freeze to thaw naturally. Do not attempt to thaw the freeze with a torch as thermal shock damage to the pipe can occur. Always wear protective gloves and safety glass provided when handling jacket, dry ice pack or frozen pipe.

## **IMPORTANT INFORMATION ON CO<sub>2</sub> AND CO<sub>2</sub> CYLINDERS**

2. If the cylinder is overfilled or subjected to temperatures over 100°F, the bursting disc may rupture, allowing violent discharge of CO<sub>2</sub> gas.
3. Always weight tanks to prevent overfilling.
4. Store all CO<sub>2</sub> cylinders out of sunlight and away from heat.
5. Never transport cylinders in the driver's compartment of vehicle as sudden rupture of the bursting disc could distract the driver.
6. Pipe freezing kit works best when the cylinder temperature is kept below 77°F. It will not work if the cylinder temperature reaches 88°F.

**CAUTION:** CO<sub>2</sub> is heavier than air and will collect in confined or low lying work areas. Always make sure there is good ventilation to prevent suffocation. CO<sub>2</sub> gas is odorless and invisible. Disperse CO<sub>2</sub> before entering a confined or low lying work area.

**CAUTION:** Do not over fill bags as the o-rings may tear.