

## INSTALLATION INSTRUCTIONS FOR HORIZONTALLY MOUNTED POC BUSHINGS 15 kV THROUGH 72.5 kV

The bushings are shipped as standard units with the reservoir-mounting hole plugged and with oil at the standard level for vertical mounting. **PROPER OIL FILLING IS CRITICAL FOR LONG-TERM OPERATION OF THE BUSHING.**

The oil volume in all bushings fluctuates significantly with temperature. Typically this fluctuation is approximately 0.09 percent per degree Celsius.

In vertically mounted bushings, this change in volume is accommodated in the metal cover or inside the sight glass. In Lapp horizontally mounted bushings, the oil volume change is accommodated by a flange mounted oil reservoir.

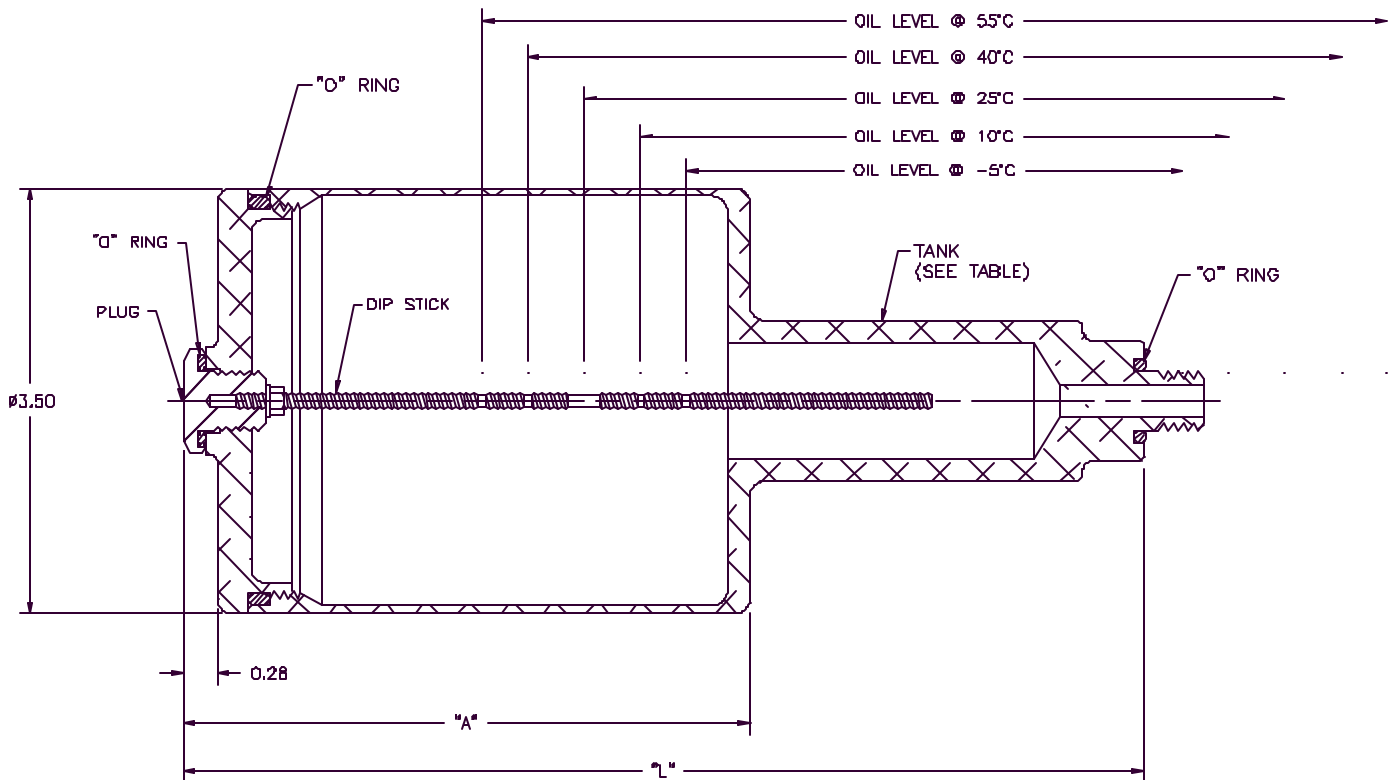
In order for this change in volume to not affect the operation of the bushing, both the highest and lowest temperatures must be considered. Lapp bushings are designed to operate with air ambients from -50°C to +40°C. The bushing will function at the highest ambient while carrying rated current. Operating the bushing at higher temperatures and/or currents is not recommended even for short periods of time.

It is important to fill and install the bushing properly to guarantee long life expectancy. Two things are extremely important. First, all air must be out of the bushing, and secondly, the oil level must be adjusted properly according to the bushing oil temperature. **FAILURE TO FOLLOW THESE INSTRUCTIONS CAN CAUSE BUSHING FAILURE.**

Before installing the bushing into the equipment (or wall), perform the following steps while the bushing is HORIZONTAL:

1. Remove the filler plug in the stainless steel cover at the top of the bushing.
2. Add oil through the fill hole in the top cover until the bushing is completely full. Tip the bushing slightly so the air bubble is at the fill hole in the top cover. Fill with oil until some oil comes out of the fill hole in the top cover. Use the extra oil supplied with the bushing, or any non-PCB type I or type II transformer oil. The oil must meet the minimum requirements for new transformer oil per IEEE C57.106-1991.
3. Replace the plug in the top cover and tighten slightly by hand. Rock the bushing back and forth to release all entrapped air inside the bushing into the sight glass area. Watch the sight glass for air bubbles. Continue rocking until no air is being released into the glass. More oil may have to be added to the reservoir.
4. Loosen the oil filler plug in the top bushing cover to bleed off the entrapped air (air bubble).
5. Add oil to the bushing until oil comes out of the fill hole in the top cover. Be sure the fill hole in the top cover is slightly higher than the bottom of the bushing.
6. Repeat steps 2 through 5 as necessary until the air bubble that remains in the top cover is less than ¼ inch in diameter. **DO NOT STORE THE BUSHING COMPLETELY FILLED.** Any oil expansion could cause the bushing to leak.

7. Install the bushing in the equipment or wall and perform the following steps immediately:
- 7a. Remove the oil reservoir plug from the flange and install the oil reservoir. Be sure the O-ring is properly installed on the reservoir.
  - 7b. Remove the oil filler plug from the oil reservoir top. IT IS IMPORTANT TO DETERMINE THE TEMPERATURE OF THE OIL IN THE BUSHING BEFORE ADJUSTING THE LEVEL. **THIS MAY BE DIFFERENT THAN THE AMBIENT AIR**. The best method is to use a dial thermometer or a thermocouple inserted as far into the oil reservoir as possible. Try to get into the flange through the neck of the reservoir. **DO NOT USE A GLASS THERMOMETER**. Wait a few minutes for the reading to stabilize.
  - 7c. Add oil to the reservoir until the oil level in the reservoir is at the proper level. FOR PROPER OIL LEVEL INDICATION, THE OIL THAT YOU ADD TO THE BUSHING SHOULD BE THE SAME TEMPERATURE AS THE OIL IN THE BUSHING. Use the dip stick to measure the oil level. The top mark is for 55°C, the second for 40°C, the middle for 25°C, the fourth for 10°C, and the bottom for -5°C oil temperature. (See figure 1) Interpolation between marks is not critical. If in doubt, use slightly less oil.
  - 7d. Tighten the oil fill plug in the bushing cover and install the oil fill plug in the oil reservoir top. (Caution: Make sure the O-rings are properly installed on the plugs.)



Tank Assembly No.	"A"	"L"
B-301207-1	4.69	7.94
B-316019-1	9.44	13.69

Figure 1