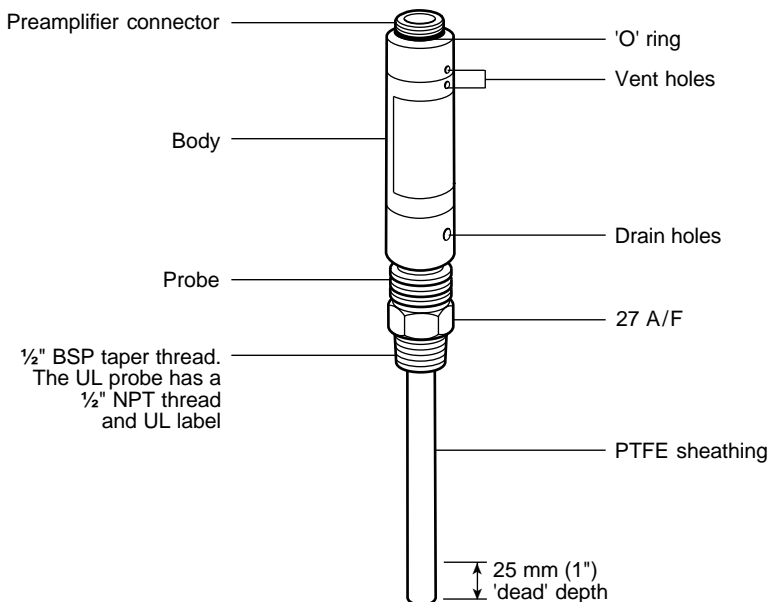


LP20

Capacitance Level Probe Installation and Maintenance Instructions



1. General safety information

Your attention is drawn to Safety Information Sheet IM-GCM-10 as well as to any National or local regulations.

Safe operation of the product depends on it being properly installed, commissioned and maintained by a qualified person in compliance with the operating instructions. It is essential to comply with general installation and safety instructions for pipeline and plant construction, as well as to make proper use of tools and safety equipment. The product is designed and constructed to withstand the forces encountered during normal use. Use of the product for any other purpose, or failure to install the product in accordance with these Installation and Maintenance Instructions, could cause damage to the product and may cause injury or fatality to personnel.

2. General product information

The Spirax Sarco LP20 is a capacitance level probe designed for continuous level detection in conductive liquids, in conjunction with a preamplifier, which is supplied separately.

It is suitable for use at pressures up to 32 bar g (464 psi g) and temperatures up to 239°C (462°F). Maximum ambient temperature is 70°C (158°F). Minimum conductivity is 5 µS/cm or 5 ppm. The probe is normally installed in a steam boiler or metal tank where it is earthed through the 1/2" BSP taper (UL version 1/2" NPT) connection, the boiler or tank forming the return path. It may be installed in a non-conductive tank (e.g. plastic or concrete), if an earth rod is provided. The LP20 probe is compatible with the Spirax Sarco range of controllers and transmitters, which are described in separate literature.

3. How the LP20 probe works

The probe consists of a metal rod completely insulated from the liquid by PTFE sheathing. It works by sensing the variation in capacitance caused by a change in water level, an increasing level giving a proportionally increasing output. The capacitance is measured by the preamplifier and transmitted as a dc signal to the controller or transmitter. Control and switching levels are set in the controller.

The preamplifier sensitivity is selected according to the immersed length of the probe, and the wiring variations that achieve this are described in the preamplifier Installation and Maintenance Instructions (IMI).

4. Installation

WARNING: The LP20 probe must not be cut to length. Do not install the probe outdoors without additional weather protection. Do not block the drain or the vent holes.

A protection tube of 80 mm (3") nominal bore is required for boilers, or in tanks where turbulence is likely. This should be as long as possible, and at least long enough to cope with the expansion of the probe at maximum operating temperature (0 - 239°C, 32 - 462°F).

Allow 20 mm (¾") clearance for probes up to 750 mm in length, and 38 mm (1½" for longer probes).

4.1 Install the probe as follows:

- Ensure both male and female threads are in good condition.
- Use up to three turns (no more) of PTFE thread sealing tape on the probe thread.
WARNINGS: Do not use excessive tape. Do not use paste type jointing compound.
- Fit and tighten the probe by hand initially - use a suitable spanner to tighten the probe. Under no circumstances use a pipe wrench.
- Due to the nature of a taper/parallel joint it is not possible to recommend tightening torque figures.
- Do not overtighten - there should always be visible thread on the probe.
- **Note:** The probe thread will not 'bottom out' (i.e. probe body hexagon contacts the face of the female screwed connection), unless there is excessive wear or an out-of-tolerance female thread, in which case it will be necessary to replace or re-work the flange or connection. After installation ensure that resistance from the probe body to the pipework/boiler shell is less than 1 Ω.

4.2 Subsequent removal and refitting:

Cabling should be installed in accordance with BS 6739 - Instrumentation in Process Control Systems: Installation design and practice or local equivalent.

Warning: Ensure boiler or vessel is depressurised and vented to atmosphere before attempting to unscrew or remove the probe.

- Always use the correct size spanner - not a pipe wrench.
- Inspect male and female threads for signs of damage, which may have occurred through overtightening, leading to torn threads or even localised cold welding (galling/picking up).
- If damage has occurred replace the probe.
- Carry out an electrical continuity check to ensure that the resistance between the probe body and the boiler or tank is less than 1 Ω.
- An 'O' ring is supplied with both the LP20 and PA20. Ensure only one 'O' ring is fitted between the probe and the PA20 preamplifier.

The preamplifier must only be screwed on hand tight to avoid damage to the 'O' ring. Refer to preamplifier IMI for further information.

5. Wiring

Refer to the preamplifier and controller/transmitter Installation and Maintenance Instructions for wiring details and diagrams.

6. Maintenance

No special maintenance is required.

Boiler water level controls and alarms do, however, require regular testing and inspection. Specific testing instructions for Spirax Sarco systems are covered in separate literature.