WATER SUPPLIES DEPARTMENT

STANDARD SPECIFICATION E-84-01

CONDUCTIVITY LEVEL ELECTRODE EQUIPMENT

1. GENERAL

The level electrode equipment shall be for level detection of a conductive liquid in a reservoir or tank for alarm and control applications. The equipment shall consist of a set of electrodes and a controller, which shall operate on the conductivity principle and shall react upon change in resistance between sensing and earth electrodes.

For pump on-and-off or valve open-and-close control, a controller shall be provided that shall remain self-latching in one state until it is electrically changed over into the other state when the liquid level has risen or fallen to a pre-determined level.

The controller shall be designed for 'fail-safe' operation on mains supply failure. Selection of 'fail-safe-high' mode and 'fail-safe-low' mode shall be provided.

The electrode system shall be designed to eliminate the effect of spurious conductivity paths caused by leakage or moisture between electrodes or entanglement of electrodes by impurities or debris in the liquid.

2. DESIGN

The equipment shall comply with the following requirements: -

(a) Electrode sensing signal	:	Maximum voltage : 25Vrms, 50 Hz Maximum current : 30 mA Screened double-wound transformers shall be used for providing power supply for the electrode sensing signal.
(b) Controller output contacts	:	Dual volt-free changeover contacts, rated at 2A, 220V, 50 Hz Contact operation shall have an adjustable time delay from 1 to 5 seconds.
(c) Electrode-controller wiring	:	The wiring of 1.5 mm^2 copper cable shall have a length of not less than 100 metres.
(d) Controller sensitivity	:	The controller shall suit the characteristics of the measured liquid with minimum adjustable range from 100 ohm to 15k ohm.
(e) Function display	:	Mains supply and relay operation indications

(f) Power supply : 220V, 50 Hz

3. CONSTRUCTION

The level controller shall be suitable for mounting in a panel. For field mounted controllers, the enclosure panel shall have a degree of protection IP65 to IEC 60529.

The electrode head/holder shall be manufactured from moulded phenol or material with a high strength and chemical resistance. It shall be able of preventing ingress of moisture and have a degree of protection IP67 to IEC 60529. When it is used in pressurised vessel, the mounting flange shall be able to withstand the working pressure inside the vessel. Multi-electrode head/holders shall not be accepted unless otherwise specified. In that case the number of electrodes held for each electrode head/holder shall be not more than 5 and separators for spacing the electrodes shall be provided.

The electrode shall be manufactured from stainless steel rod of nominal outside diameter of 6 mm, or stainless steel tube with minimum wall thickness of 2 mm and nominal diameter of 18 mm. The electrodes shall be covered with polypropylene, PTFE or PVC coating from the head to within 75 mm of the end. To facilitate site installation, the electrodes shall be supplied in lengths of not exceeding 1500 mm unless otherwise specified. Suitable threaded connection pieces shall be supplied for jointing electrodes of length longer than 1500 mm.

- End of this Specification -