



**Technical Data Sheet No. T30 501.1**

**EFT7 Compact Capacitance  
Level Indicator with Band Electrode**



***Excellence in Level Measurement***



**EUROGAUGE**

*... the level people*

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## Declaration of Conformity

### EFT7 Compact Capacitance Level Indicator

This is to certify that the above named product fully complies with the requirements of the normative sections of the following harmonised European Standards.

EN50081-1 : Electromagnetic Compatibility - Generic Emission Standard.  
Part 1 : Residential, Commercial and Light Industry.

EN50082-2 : Electromagnetic Compatibility - Generic Immunity Standard.  
Part 2 : Heavy Industry.

EN 61010-1 : Safety requirements for electrical equipment for measurement,  
control and laboratory use.

Signed :

**(J Graham)**

Position : Technical Manager

Date : 15/05/2001

This declaration applies to the following Part Number:

572022142 : Compact Capacitance level Indicator with Band Electrode.



## 1. Application

The EFT7 Capacitance Level Indicator is intended for continuous measurement of non-conducting liquids such as fuel oil in tanks. The instrument is completely self-contained, requiring only a supply voltage and having a 4-20mA constant current and a 0 - 10 Volt signal output.

## 2. Operation

The unit operates on the principle of a changing electric field caused by the presence or absence of oil around the electrode. This change, after amplification, is used to provide the output signals. An LED indicator shows that the unit is energised.

## 3. Installation

### 3.1 Mechanical

The unit must be mounted on the tank in such a position that the maximum ambient (external) temperature of 50°C is not exceeded. Protection against direct sunlight should be provided by the provision of a suitable shield or hood.

The mounting connection is by a 1" BSP parallel thread. When fitting the unit into the mounting boss, make sure the 'C' spanner is used on the metal boss, and that the housing is not used to turn the unit into the boss.

Make certain that the rubber sealing ring of the housing cover is in place before securing the cover and the four cover screws are securely tightened down.

### 3.2 Electrical

Prior to connecting the unit, check which supply voltage is available. Select either 110V or 230V ac on voltage selector links if mains voltage is used.

The unit can be used with either a 110V/230V ac supply or a 24 Volt ac or DC supply (see connection diagram on page 4). When used with a 24 Volt ac or DC supply, there is a common connection between the supply negative/neutral and the output ground.

Two Pg11 cable glands are provided for cables having an outer diameter of 5-8mm.

The clamping nut should be securely tightened to prevent the ingress of dust or moisture and to ensure compliance with the IP65 physical protection.

The earth connection is internally connected to the mounting boss and must be connected to a suitable earth point, the tank should not be relied on for earthing purposes.

## 4. Maintenance

The electrode should be checked for any signs of damage or wear at intervals when the container is cleaned. No maintenance is required under normal usage.



## 5. Commissioning

With the supply switched on and all other electrical connections completed the Level Indicator must be allowed to warm up for a few minutes before attempting any adjustment. With a suitable multimeter connected to either the 4-20mA current output or to the 0-10V terminals, proceed as follows:

### 'Zero' adjustment with tank empty (probe uncovered) or with the probe outside the tank in air

1. Turn **100% control** Fully clockwise (Multi-turn control).
2. Turn **0% control** Fully clockwise (Multi-turn control).
3. Turn **100% control** If output is over 100% turn control in a counter clockwise direction until readout shows approximately 80%.
4. Turn **0% control** In counter clockwise direction and bring output reading back down to zero.
5. Turn **100% control** In clockwise direction to stop position, i.e. maximum amplification.
6. **Repeat Instruction 4** To achieve reading of zero  $\pm 0.5\%$ .

**Attention!** - The 0% control must on no account be re-adjusted otherwise the above 'zero' adjustment procedure must be repeated.

### 'Full' adjustment with tank full

1. Turn **100% control** Slowly anti-clockwise to adjust reading on the readout to 100%  $\pm 0.5\%$ .

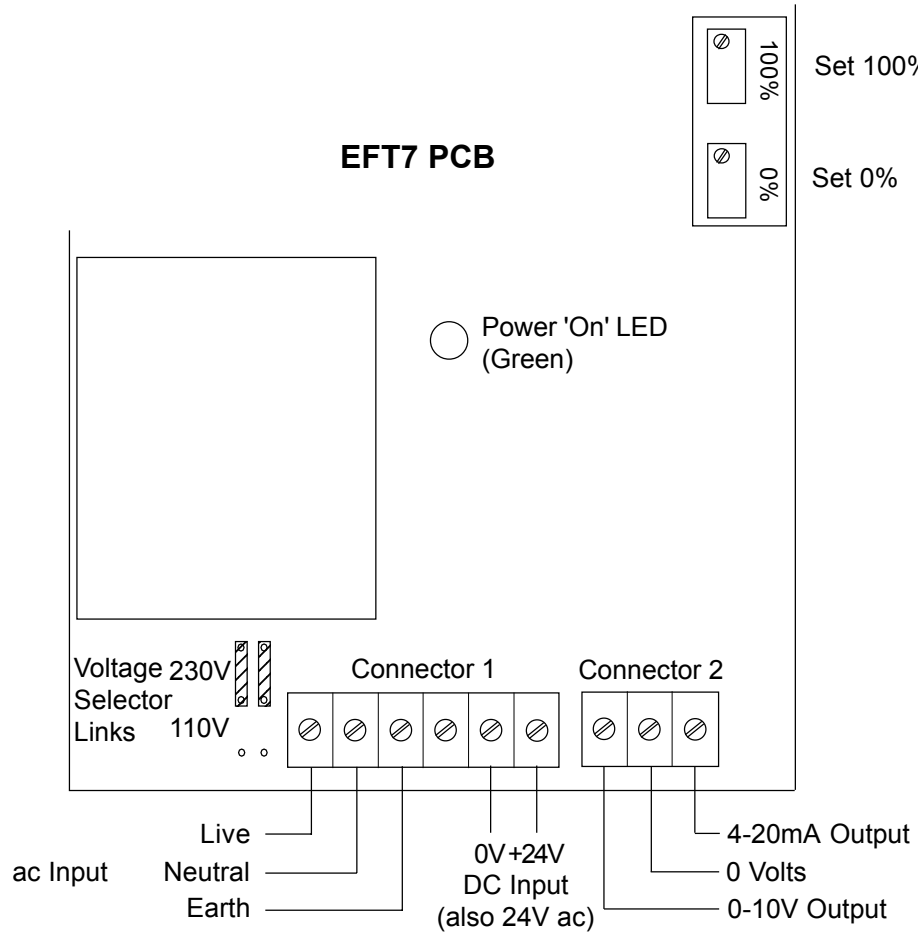
**Calibration is now complete and the instrument is ready for use.**

### Notes:

1. In installations where the tank cannot readily be emptied for the zero adjustment to be carried out, and the user has carried out the zero adjustment with the probe outside the tank in free air, we recommend that the zero level is checked when the tank reaches the actual empty level and re-adjusted, if necessary.
2. A preliminary full adjustment can also be carried out when the tank cannot be completely filled. The full adjustment instructions should then be followed to set the indication on the meter in accordance with the actual contents of the tank. In order to avoid possible inaccuracies we strongly recommend that this procedure should only be carried out when the tank can be filled to the exact half full mark. The full adjustment procedure described above can then be adopted to set the readout meter to the 50% mark in lieu of 100%. It is essential that such an adjustment is checked and a re-adjustment carried out when the tank has been filled to the full mark.



**6. Wiring Connections and Controls**



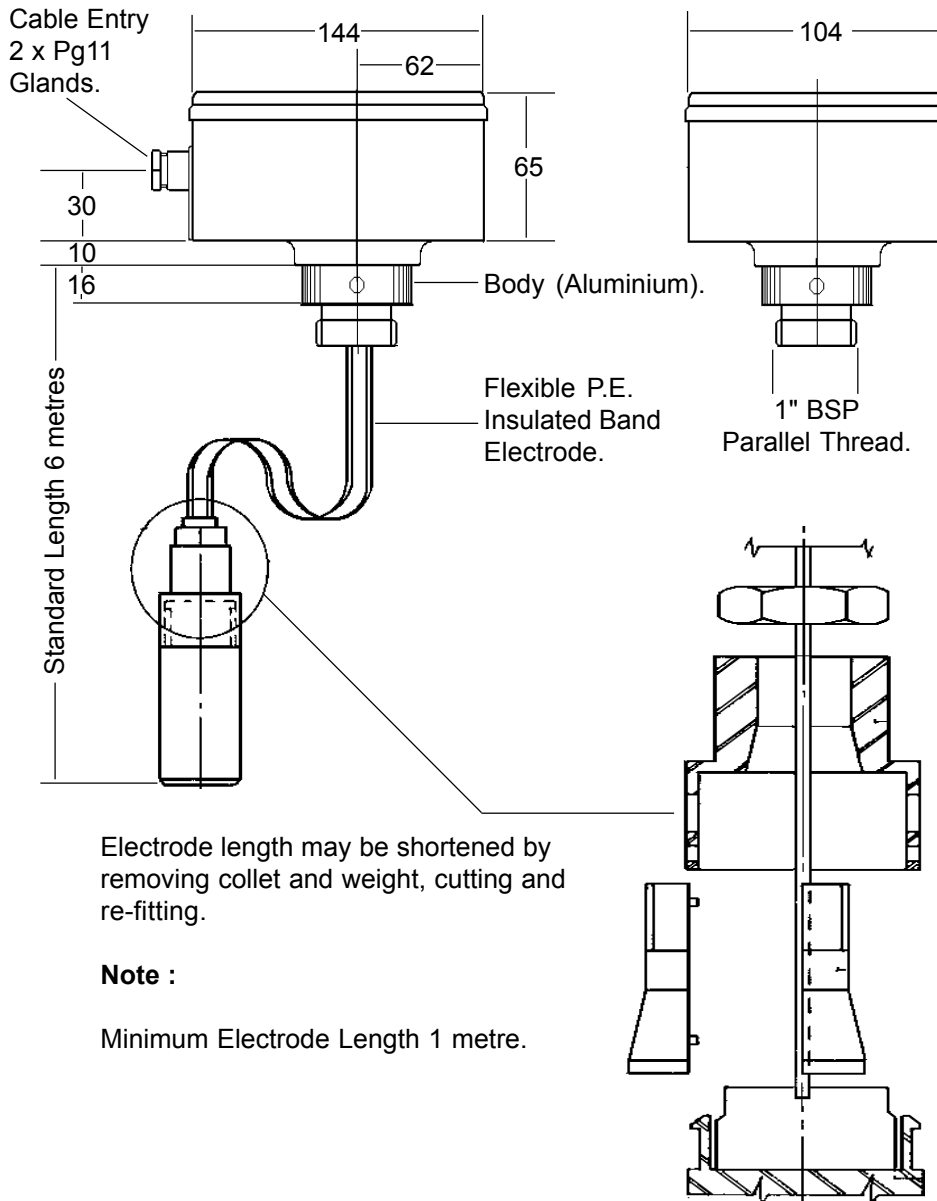


## 7. Specification

Supply	Either 110/230V : 50Hz : Tolerance +10%, -15%, or 24 Volts DC (20 - 28V DC), or 24 Volts ac (20 - 28V ac).
Part Number	572022142 : EFT7 Capacitance Level Indicator.
Application	Continuous Level Indication in fuel oil or diesel tanks, <= 35 seconds Redwood No 1.
Electrode	6 metre P.E. insulated flexible band electrode. (Minimum Electrode Length 1 metre).
Range	Max Co + $\Delta C$ = 300pF.
Linearity	< +2% for $\Delta C$ = 75pF and Co = 200pF.
Power Indicator	LED (green) - ON when power energised.
Outputs	0 - 10V DC : load $\geq$ 10k $\Omega$ . 4-20mA constant current : load $\leq$ 500 $\Omega$ .
Controls	0% Set Zero (Empty Tank), 100% Set Full.
Temperature	Ambient : -20° to 50 °C : Co-efficient : 0.1%/°C.
Connections	6 Way Terminal Block for Power Supplies (ac and DC). 3 Way Terminal Block for Outputs : 0-10V DC ; 4-20mA. Maximum cable size - 1.5mm <sup>2</sup> .
Housing	Glass loaded ABS.
Cable Entry	2 x PG11 cable glands for 5-8mm diameter cable.
Protection	IP65 (BS5490/IEC529).
Note	We reserve the right to alter the design or specification of this product without prior notice.



8. Outline and Dimensions



Electrode length may be shortened by removing collet and weight, cutting and re-fitting.

**Note :**

Minimum Electrode Length 1 metre.