EFT 7
Capacitance Level Indicator

+ Read guide before use!
+ Observe all safety information!
+ Keep guide for future use!

If In Doubt ASK !

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About this User Guide

This guide is part of the device installation.

Read this guide before using the device.

Keep this guide during the entire service life of the device and always have it readily available for reference.

Always hand this guide over to future owners or users of the device.

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WARNING TERMS

The type and source of danger associated with this device is shown here.

Precautions to take in order to avoid the danger are shown here.
There are three different levels of warning:

DANGER	Imminent danger! Failure to observe the information will result in death or serious injuries.
WARNING	Possible imminent danger! Failure to observe the information may result in death or serious injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or serious injuries and damage to property or device not working as expected.

General Installation and Wiring requirements

The device must be installed in accordance with the details given later in this guide.

All wiring must be in suitable cable for the application conditions and must comply with the relevant regulations of the electrical supply authority concerned, together with any other statutory requirements which may affect the complete installation.
It is recommended that cable with polyethylene or PVC insulation with a conductor size of at least 1.0mm^2 is used.

CAUTION **ATEX installations may only be carried out by qualified and trained personnel in accordance with ATEX specific requirements.**

MICC cable (Pyro) must never be used under any circumstances

Signal cables should be run separately from any cables carrying mains voltages.

If signal cables are to be run through areas of high electrical interference it is recommended that screened cable is used with the screens being terminated only to the device earth terminal or as specified.

Specific terminal connection information may be found on identification label(s) on the device unless otherwise advised..

Refer to separately supplied installation guides for information regarding external components of the system such as level sensors, sounders and beacons etc.

CAUTION Electrical systems may be impacted and the device switching contact (if fitted) may be destroyed by voltage peaks when inductive loads are switched off.

Use commercially available standard RC combinations such as 0.1µF/100Ω for inductive load switching.

Troubleshooting

Repairs and fault finding may only be performed by Afriso Eurogauge personnel or qualified personnel under Afriso Eurogauge instruction.
Refer to separately supplied installation guides for information regarding fault finding and repairs on external components.

Safety

Intended use

The level indicator device may only be used for continuous level monitoring in containers and tanks for the storage of the following media, provided such media can be detected with a capacitance probe.

Liquids

Any use other than the application explicitly permitted in this guide or authorised by Afriso Eurogauge is not permitted.

Predictable incorrect application

The device must never be used in the following cases:

Hazardous area (ATEX)
If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.

Safe handling

This product represents state-of-the-art technology and is made according to the pertinent safety regulations. Each device is subjected to a function and safety test prior to shipping.

Operate the device only when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.

WARNING **Severe burns or death caused by mains voltage (110/230 VAC, 50/60Hz) in the device**

Do not expose the control unit to water.

Interrupt the mains voltage supply before opening the device or before performing maintenance and cleaning work and make sure it cannot be switched on by accident.

Do not tamper with or modify the device in any way whatsoever.

Transport and storage

CAUTION **Damage to the device due to improper transport.**

Do not throw or drop the device.

Protect from wetness, humidity, dirt and dust.

CAUTION **Damage to the device due to improper storage.**

Protect from wetness, humidity, dirt and dust.

Store the device in a clean and dry environment.

Only store the device within the permissible temperature range.

Staff Qualification
The device may only be mounted, commissioned, operated, maintained, shut down and disposed of by trained staff. Electrical work may only be performed by trained electricians and in compliance with all applicable local and national directives.

Modifications to the device
Changes or modifications made to the device by unauthorised persons may lead to malfunctions and are prohibited for safety reasons unless specifically instructed by the manufacturer.

Use of spare parts and accessories
Use of unsuitable spare parts and accessories may cause damage to the device. Use only genuine manufacturer spare parts and accessories.

Liability information
The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations given in this guide or ancillary documents.
The manufacturer or sales agent shall not be liable for costs or damages incurred by the user or by third parties in the usage or application of this panel, in particular in case of improper use of the device, misuse or malfunction of the connection, malfunction of the device or of connected devices.
The manufacturer or sales agent shall not be liable for damage whatsoever resulting from any use other than the use explicitly permitted in this guide or ancillary documents.
The manufacturer shall not be liable for misprints.

Disposal and Recycling
Switch off the supply voltage and disconnect from device.
Disconnect all other terminals and remove wiring from device.
Dismount the device.
To protect the environment, this device must **not** be disposed together with normal household waste
Dispose of the device according to according to local directives and guidelines.
This device consists of materials that can be recycled.
Electronic inserts can be easily separated and the device consists of recyclable materials.
Where it is not possible to dispose of the device locally in accordance with environmental regulations please contact us for return or disposal instructions.

Warranty
The manufacturer's warranty for this device is 24 months after the date of purchase.
This warranty shall be good in all countries this device is sold by the manufacturer or its authorised dealers or agents.
Refer to separately supplied installation guides for information regarding warranty on external components.

Copyright
The manufacturer retains the copyright to this device. This guide or any separately supplied installation guide may not be reprinted, translated, copied in part or in whole without prior written consent.
We reserve the right to make technical modifications with reference to the specifications in this guide without notice.

Customer Satisfaction
Customer satisfaction is our prime objective.
Please get in touch with us if you have any questions, suggestions or problems concerning the device or external components.

Contact
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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.

Electrode length may be shortened by removing collet and weight, cutting and re-fitting.
(See Page 9).

Note :
Minimum Electrode Length 1 metre.

3.2 Electrical

Prior to connecting the unit, check which supply voltage is available. Select either 110V or 230/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.
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 hung outside the tank in free air (keep probe electrode cable away from any metallic or human obstructions)

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 ± 0.5%.

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

Final 'Full' adjustment with tank full (must be carried out to ensure accuracy)

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

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

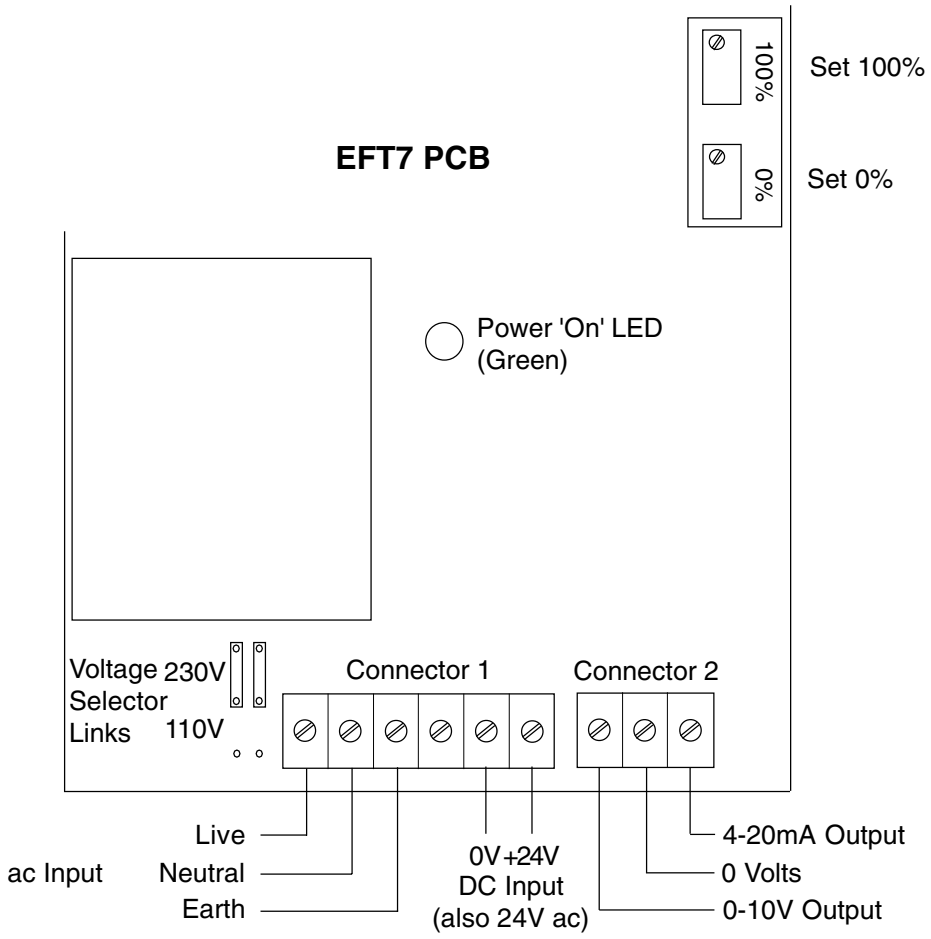
Notes:

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



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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 + ΔC = 300pF.
Linearity	< +2% for ΔC = 75pF and Co = 200pF.
Power Indicator	LED (green) - ON when power energised.
Outputs	0 - 10V DC : load >= 10kΩ. 4-20mA constant current : load <= 500Ω.
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^2.
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.

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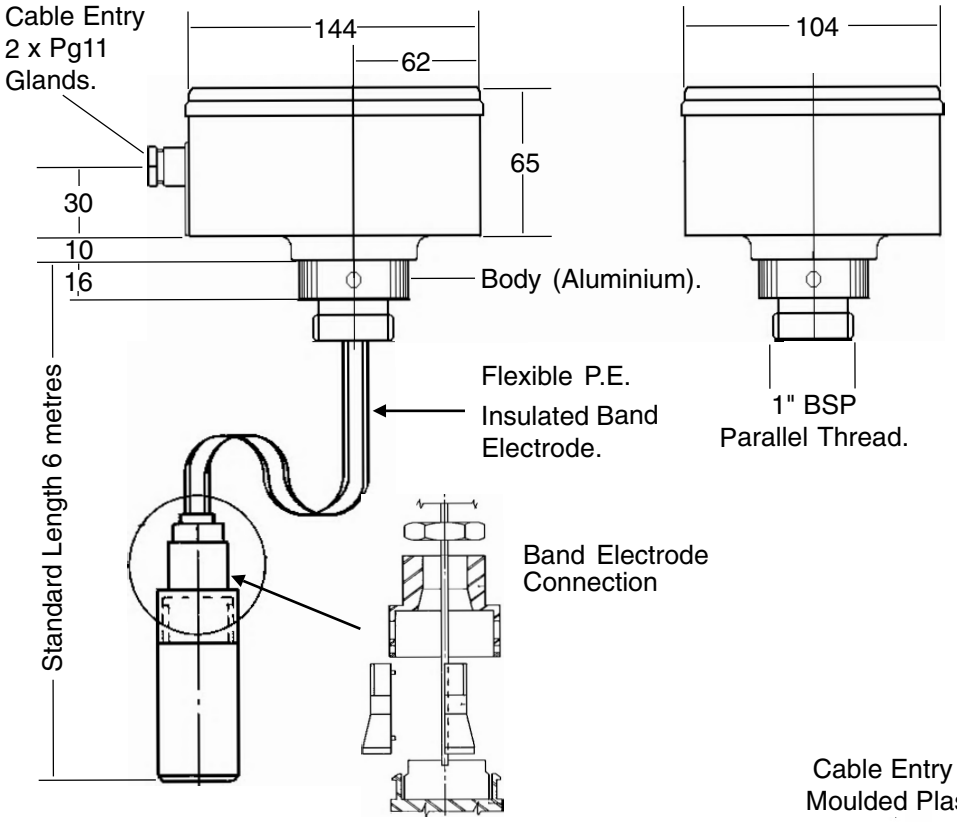
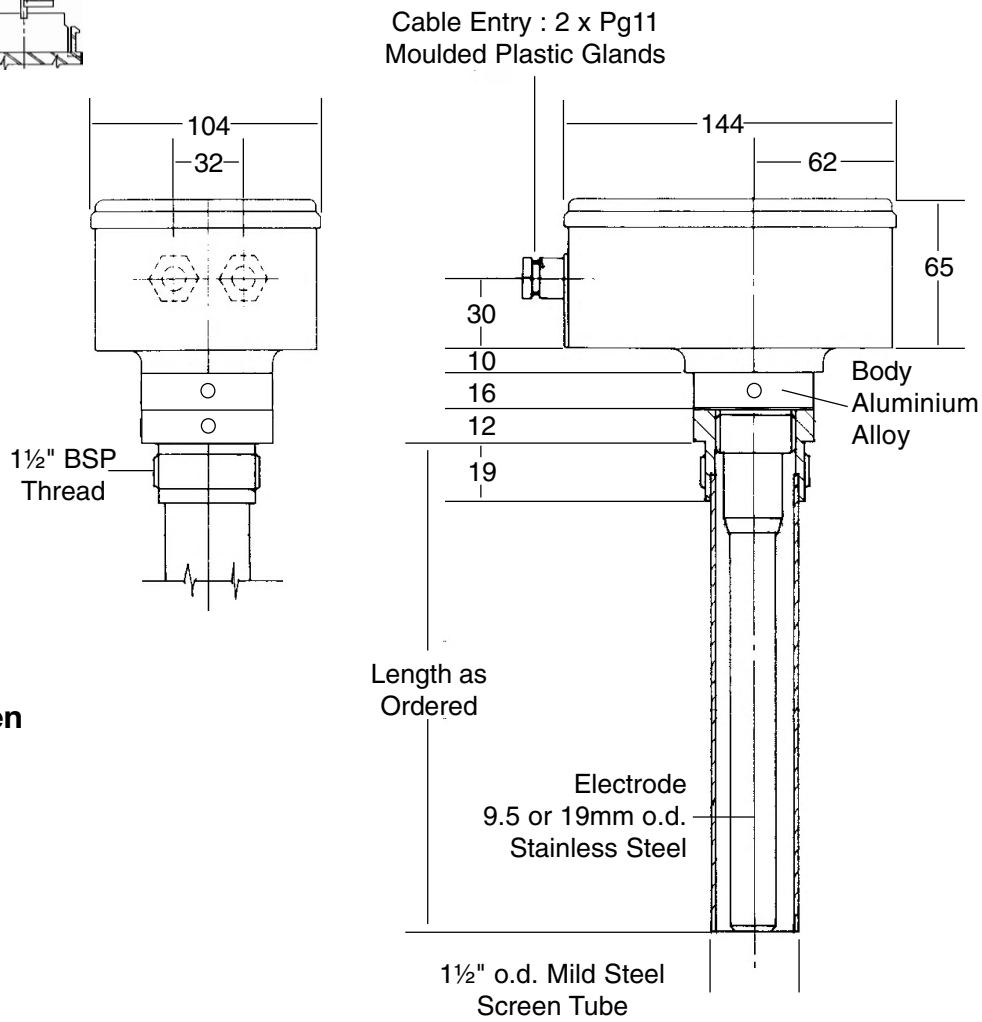
8. Outline and Dimensions



Flexible Electrode Version



Solid Electrode/Screen Tube Version

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Declaration of Conformity

CE

EFT 7 Capacitance Level Indicator

This is to certify that the above named product fully complies with the Electromagnetic Compatibility Directive 2014/30/EU and the Low Voltage Directive 2014/35/EU of the European Union and with the requirements of the normative sections of the following harmonised European Standards.

BS EN 61000-6-3:2007+A1:2011
Electromagnetic Compatibility - Generic Emission Standard.
Emission standard for Residential, Commercial and Light Industry.

BS EN 61000-6-2:2005
Electromagnetic Compatibility - Generic Immunity Standard.
Immunity for industrial environments

BS EN 61010-1:2010
Safety requirements for electrical equipment for measurement, control and laboratory use.

Signed: D C Ward Position: Technical Manager Date: 13/09/2016

This declaration applies to all 57*xx* Series part number(s) as specified in this User Guide

Declaration of Product Origin

EFT 7 Capacitance Level Indicator

We confirm that the following product designs originate and have been wholly manufactured within the United Kingdom of Great Britain and Northern Ireland by:

Afriso Eurogauge Ltd.
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Fleming Way, Crawley,
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Signed: D C Ward Position: Technical Manager Date: 20/04/2015

This declaration applies to all 57*xx* Series part number(s) as specified in this User Guide

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