LIQUID LEVEL Systems

Series 500

Liquid Level Transmitters

Instruction Manual

Contents

1 Introduction

1.1 General Overview

The *Series 500* is a pressure transmitter suitable for hydrostatic depth measurement which continuously outputs both analogue (4…20mA) and digital (RS485) signals simultaneously. The temperature of the process can also be monitored. The RS485 interface provides a communication link to digital monitoring systems, such as the GWK *Tank Gauging System*. The transmitter's parameters, including zero and span, can also be adjusted via the RS485 interface with the *GWK Series 500 Configurator* software.

This transmitter offers a very high accuracy over a wide temperature range, an excellent repeatability and very long term stability. Large numbers of transmitters can be interconnected in a multi-drop configuration to help cut down on cabling.

The sensor is isolated from the process by a stainless steel diaphragm and a filling liquid. The electronics are located within the hermetically sealed transmitter housing which gives the *Series 500* an excellent resistance to shock and vibration. The electronics is a state-of-the-art signal processing unit fitted with a fast micro-controller allowing the compensation of drift effects due to temperature on the sensor signal, over a wide temperature range with a fast response time. The protection class is IP 68 for all models.

The mounting adaptability of the *Series 500* makes it ideally suited for use in tanks of all shapes and sizes onboard ships and in a wide range of industrial applications from water to stringent Chemical processes.

1.2 Mounting Options

The mounting adaptability of the Series 500 makes it ideally suited for use in all tanks onboard ship, and for a wide range of industrial applications from water to stringent chemical processes.
The various mounting options are as follows:

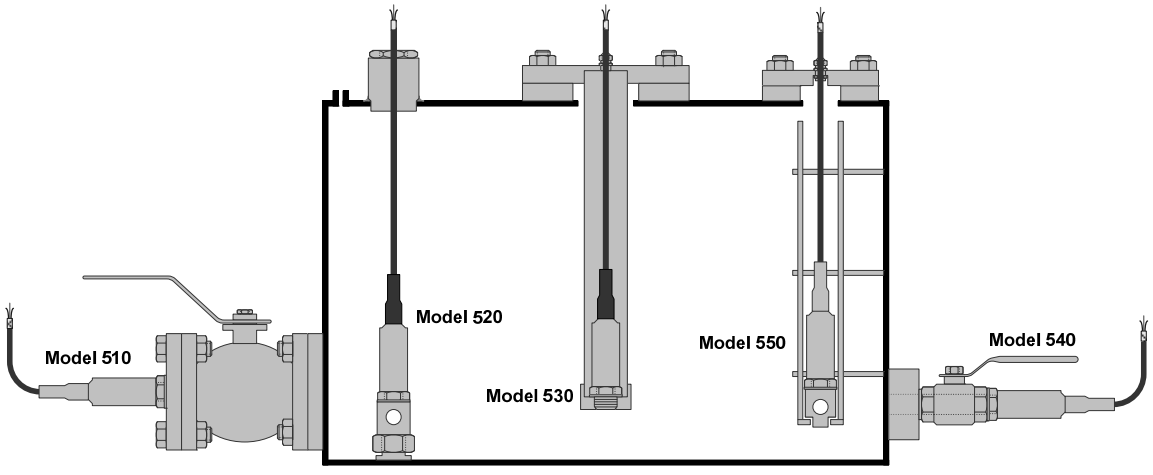
Model 510 **-** External flange mount (typically DN25, all sizes available)

Model 520 - Internal (submersible) running nut and boss connection

Model 530 - Internal (submersible) pole mount

Model 540 - External screw (¾" BSP) connection

Model 550 - Internal (submersible) guide pipe



2 Installation Notes

2.1 Transmitters

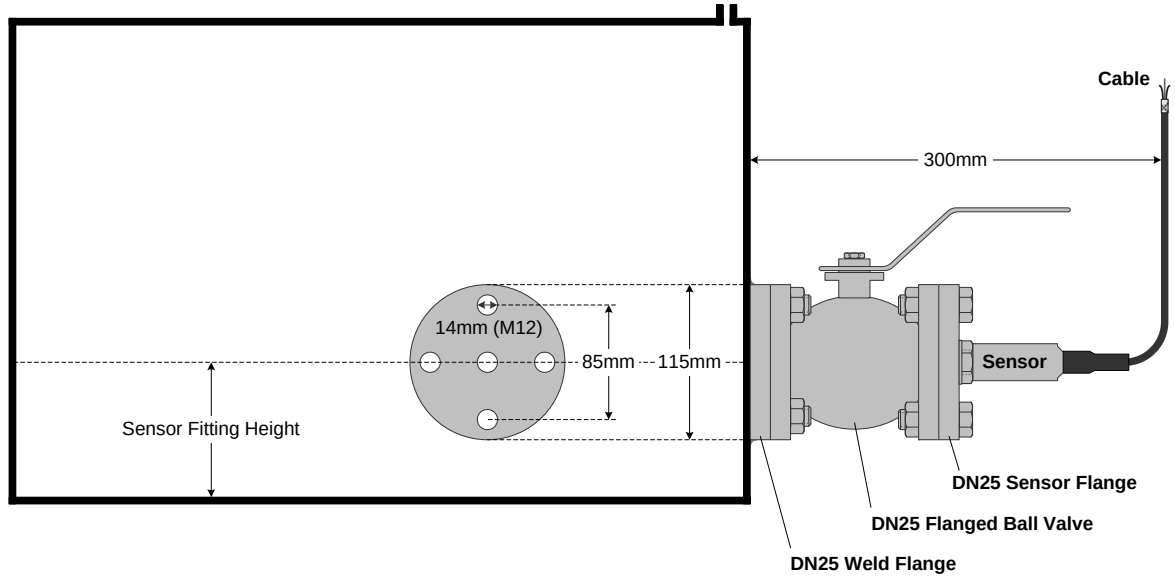
2.1.1 Model 510

The Model 510 is supplied with a flange (typically DN25) and is designed for mounting on the outside of a tank wall. A suitable mating flange should be securely welded to the tank to ensure that the centre height of the flange is strictly in accordance with the desired fitting height of the transmitter. The transmitter may be bolted directly to this flange or, for removal of the transmitter at a later date, to an isolating valve, which may be fitted between the tank flange and the transmitter flange.

Please observe the following simple precautions during installation.

1. Unscrew the black plastic protection cap from the transmitter.
2. Tightly fasten the transmitter to the flat side of the flange.
3. Bolt the transmitter flange to the mating flange.
4. Carefully unroll the cable and route towards the junction box, indicator or control unit.
5. The cable should be carefully tied or adequately protected.
6. It is not recommended that the cable be shortened; any surplus should be neatly coiled.
7. Bends in the cable should be restricted to radii of not less than 50mm.
8. Open the valve.

Model 510



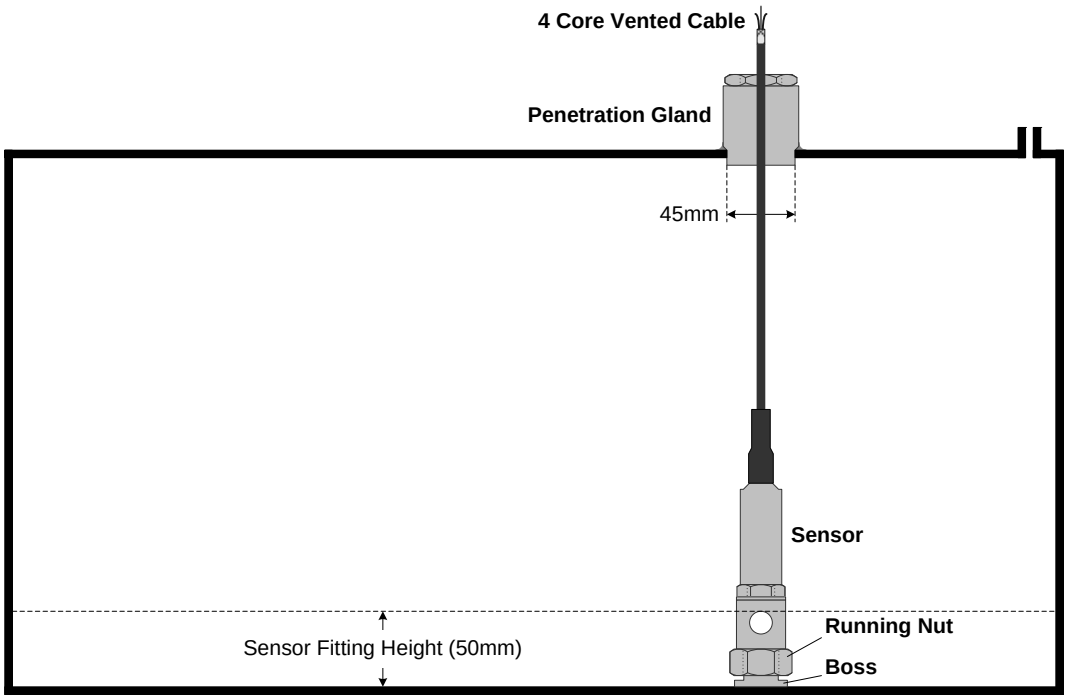
2.1.2 Model 520

The Model 520 is designed for mounting on the bottom of a tank or on the inside of a tank wall. The transmitter is fixed to the tank via a running nut and boss assembly. The transmitter is factory calibrated to meet specific user requirements and must, therefore, be fitted in the tank in the specified position and at the specified height. The fitting height of the transmitter is always determined by the diaphragm position and the diaphragm position is considered the datum point.

Please observe the following simple precautions during installation.

1. Remove the black plastic protection cap from the boss.
2. Weld the boss to the tank bottom or wall. If welding to the tank wall, make sure the middle of the boss is at the sensor fitting height specified on the order.
3. Screw the running nut of the transmitter cap onto the boss until tight. If the transmitter is mounted horizontally (on the tank wall) make sure the two holes in the transmitter cap are positioned vertically, not horizontally.
4. Carefully unroll the cable and route through the penetration gland towards the junction box, indicator or control unit.
5. The cable should be carefully tied or adequately protected.
6. It is not recommended that the cable be shortened; any surplus should be neatly coiled.
7. Bends in the cable should be restricted to radii of not less than 50mm.

Model 520



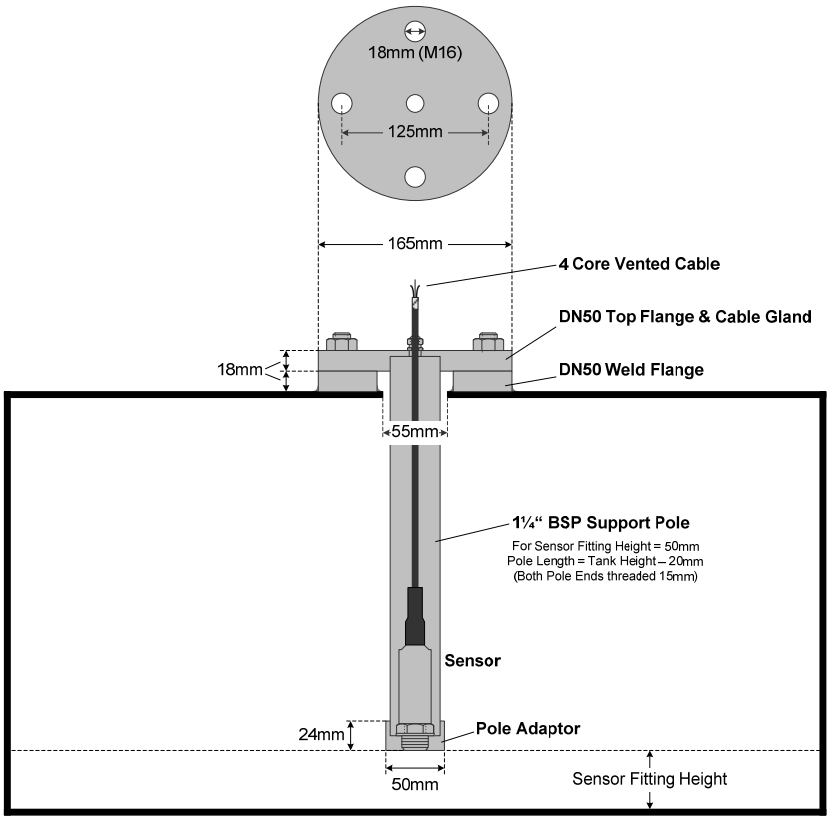
2.1.3 Model 530

The Model 530 is supplied with a special adaptor flange for mounting the transmitter directly to a pole, in such a way that the transmitter will be suspended at the end of the pole. The pole must be accurately cut to length and threaded 1¼" BSP for 15mm at both ends. Care must be taken to ensure that the final position, with respect to the diaphragm height above the tank bottom, is as specified by the user prior to manufacture.

Please observe the following simple precautions during installation.

1. Pass the transmitter through the pole from the top and pull out from the bottom.
2. Remove the black plastic protection cap from the transmitter.
3. Screw the adaptor onto the end of the transmitter.
4. Screw the adaptor (with the transmitter already fixed to it) onto the end of the pole. Make sure the transmitter cable is able to rotate freely inside the pole to avoid being twisted.
5. Carefully unroll the cable and pass through the cable gland in the DN50 Top Flange.
6. Screw the DN50 Top Flange onto the pole
7. Tighten the cable gland.
8. Bolt the DN50 Top Flange to the mating flange in the tank top or tank manhole cover plate.
9. Route the cable towards the junction box, indicator or control unit.
10. The cable should be carefully tied or adequately protected.
11. It is not recommended that the cable be shortened; any surplus should be neatly coiled.
12. Bends in the cable should be restricted to radii of not less than 50mm.

Model 530



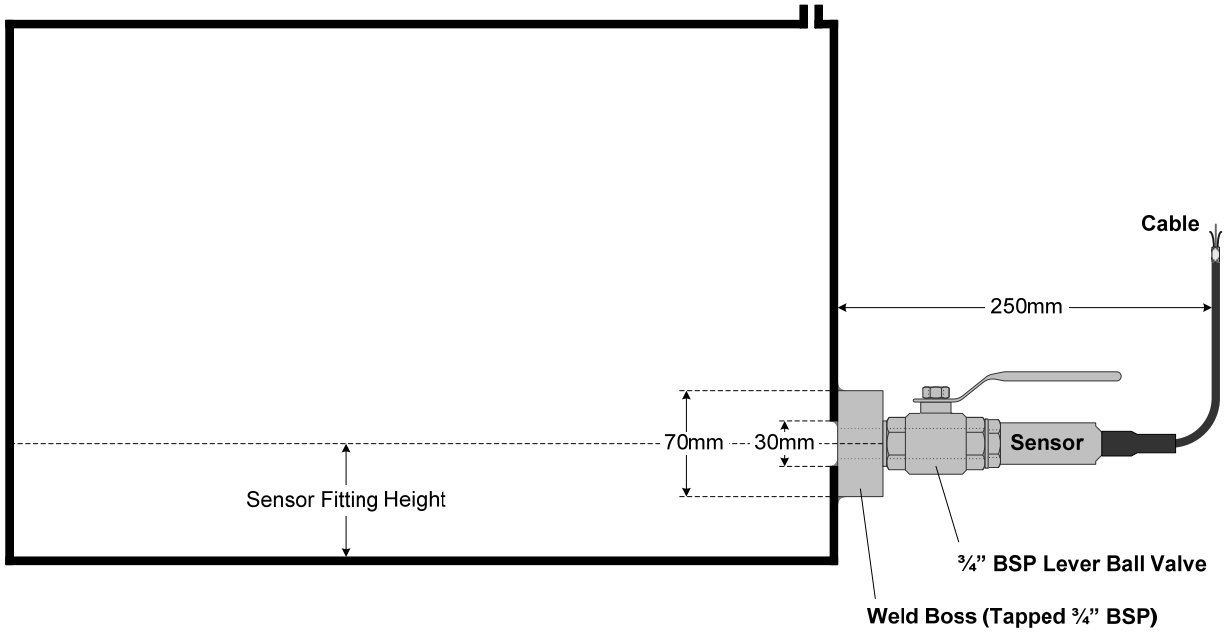
2.1.4 Model 540

The Model 540 is designed for mounting directly onto a tank boss or G3/4” isolating valve, the centre of which will be of the specified height above the tank bottom.

Please observe the following simple precautions during installation.

1. Unscrew the black plastic protection cap from the transmitter.
2. Tightly fasten the transmitter to the tank boss or G3/4” isolating valve.
3. Carefully unroll the cable and route towards the junction box, indicator or control unit.
4. The cable should be carefully tied or adequately protected.
5. It is not recommended that the cable be shortened; any surplus should be neatly coiled.
6. Bends in the cable should be restricted to radii of not less than 50mm.
7. Open the valve.

Model 540



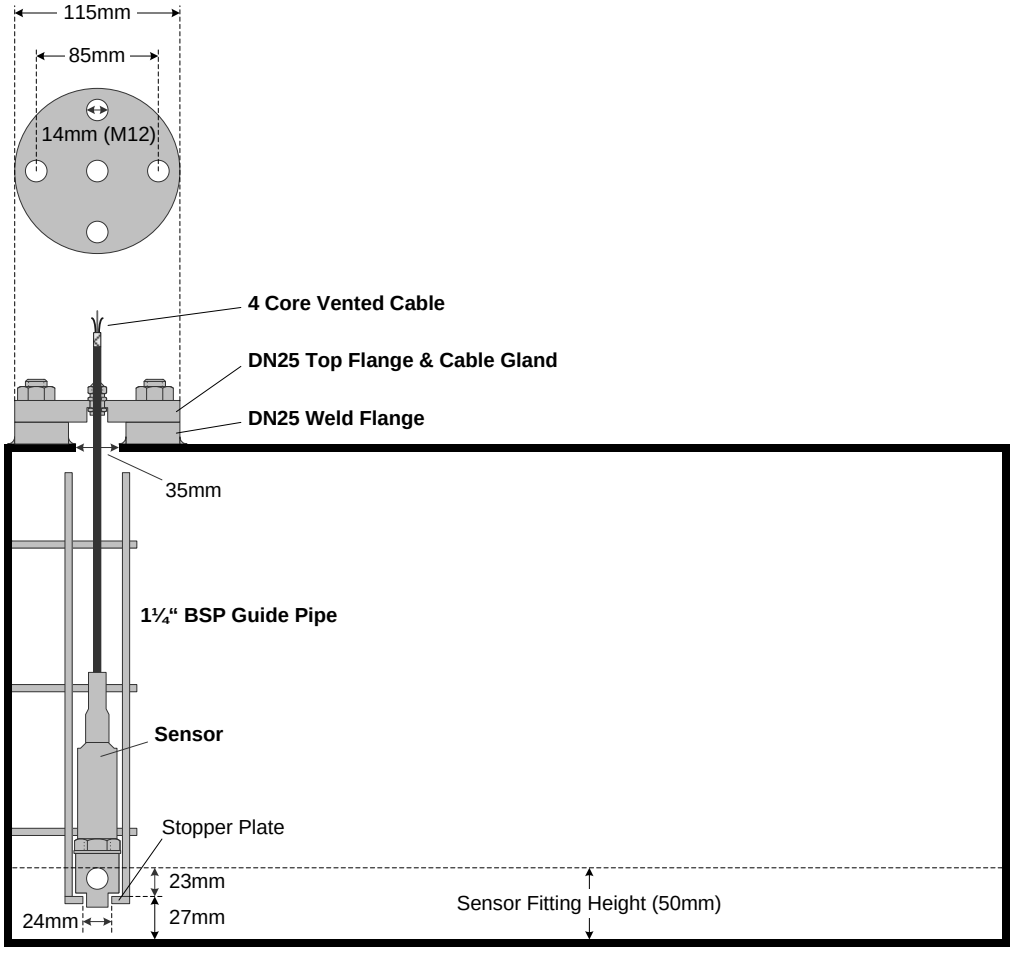
2.1.5 Model 550

The Model 550 is designed for mounting inside a tank. The transmitter is lowered through a 1¼" BSP guide pipe until it comes to rest on the Stopper Plate. The transmitter is factory calibrated to meet specific user requirements and must, therefore, be fitted in the tank in the specified position and at the specified height. The fitting height of the transmitter is always determined by the diaphragm position and the diaphragm position is considered the datum point.

Please observe the following simple precautions during installation.

1. Carefully unroll the cable and lower the transmitter through the guide pipe.
2. Pass the cable through the cable gland in the DN25 Top Flange.
3. Bolt the DN25 Top Flange to the mating flange in the tank top or tank manhole cover plate.
4. Tighten the cable gland.
5. Route the cable towards the junction box, indicator or control unit.
6. The cable should be carefully tied or adequately protected.
7. It is not recommended that the cable be shortened; any surplus should be neatly coiled.
8. Bends in the cable should be restricted to radii of not less than 50mm.

Model 550



Electrical Connections

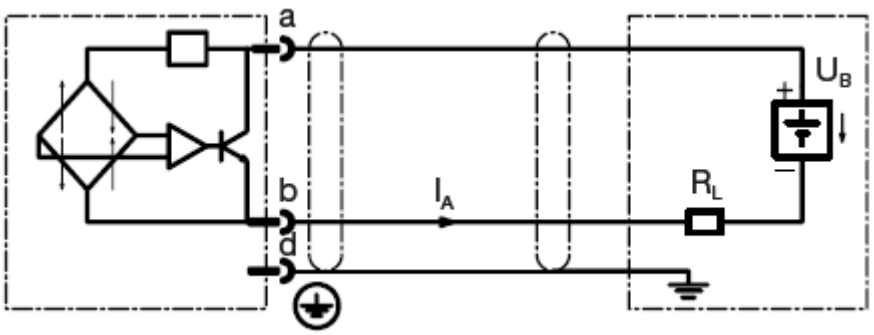
The cable provided is shielded in order to obtain the best possible EMC protection. The shield is connected to the device case. The cable will normally be prepared and bared to the correct length in works and it is not recommended that the cable be shortened, any surplus being neatly coiled. Shortening the cable may require re-calibration.

Care should be taken to ensure that the cable is never installed in a manner producing bends of less than 50mm radius; this is to ensure that any crimping or collapsing of the vent tube is avoided. The cable should be fed through conduit or neatly clipped in accordance with good practice and local regulations.

No attempts should be made to cut and re-join the cable as this would cause damage to the vent system. Where the cable is to pass through a tank wall, manhole cover or bulkhead, a suitable double watertight compression cable gland should be used.

The electrical connections for the 4-20mA output circuit are shown in the following diagram.

Connection Diagram



The cable contains a nylon vent tube and the following wires:

Colour	**Function**
Black	Positive (a)
Red	Negative (b)
Screen	Earth (d) (Connected to sensor case; does not require external connection)
Yellow	RS485 A
White	RS485 B

The yellow and white wires are not required for standard 4-20mA circuits.

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