

GWK Electronics Ltd

82 Sea Avenue, Rustington, West Sussex BN16 2DL, UK | Tel/Fax: +44 (0)1903 782345

www.gwkelectronics.com | Email: sales@gwkelectronics.com

Series 600

Self Powered Contents Gauges

Instruction Manual

Contents

Section	Content	Page
1	Introduction	
	1.1 Sensor	3
	1.2 Capillary	4
	1.3 Bulkhead Fitting	4
	1.4 Indicator	4
2	Installation Notes	
	2.1 600ES & 600SM	5
	2.1.1 Standard	5
	2.1.2 Capillary detachable at Sensor	6
	2.1.3 Capillary detachable at Sensor using Bulkhead Penetration Fitting	7
	2.1.4 Capillary detachable at Indicator	8
	2.1.5 Capillary detachable at Indicator using Bulkhead Penetration Fitting	9
	2.2 600IM	11
	2.2.1 Standard	11
	2.2.2 Capillary detachable at Sensor	12
	2.2.3 Capillary detachable at Sensor using Bulkhead Penetration Fitting	13
	2.2.4 Capillary detachable at Indicator	15
	2.2.5 Capillary detachable at Indicator using Bulkhead Penetration Fitting	16
	Appendices	
	1 600ES	18
	2 600SM	19
	3 600IM	20
	4 600IS	21
	5 Bulkhead Penetration Fitting	22
	6 Wall Mounted Indicators (100mm, 160mm)	23
	7 Flush Panel Mounted Indicators (100mm, 160mm)	24

Section 1 - Introduction

The Series 600 consists of four basic parts:

- Sensor
- Capillary
- Bulkhead Fitting
- Indicator

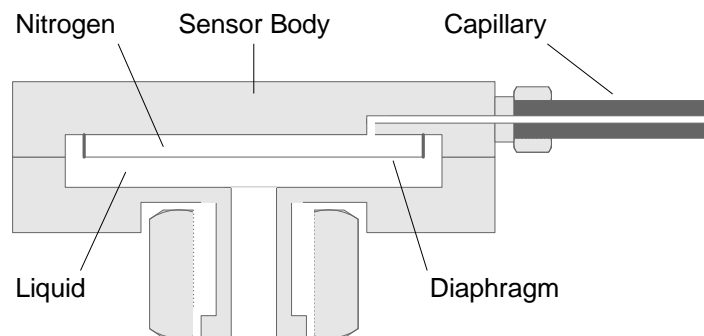
1.1 Sensor

The pressure sensitive diaphragm is made of stainless steel, having excellent temperature stability and can be used for a wide range of liquids.

The diaphragm is housed in the sensor with the process liquid on one face and nitrogen at atmospheric pressure on the other side. Nitrogen is used as it is an inert gas.

The sensor body may be of mild steel, brass or stainless steel. Mild steel is suitable for oil, stainless steel for sea water and, for drinking water, we recommend brass.

As the level of liquid increases, the pressure increases and this is transmitted through the capillary and, in turn, operates the analogue indicator.



For ships, types ES (Externally Supported) and SM (Side Marine) are used for external fitting. Model SM is particularly useful for very viscous liquids and slurries because there are many ways for the liquid to enter the sensor through several holes in the flange. Model IM (Internal Marine) is used for internal mounting.

1.2 Capillary

The internal capillary is sheathed in Terylene reinforced PVC covering. Internal capillary is stainless steel protected. The external capillary can be up to 100 metres in length. All models are supplied with the standard length of 3 metres cable, internal and external.

The capillary can be detached from the sensor, if specified, without any extra charge. This has the considerable advantage that the capillary can be passed through small holes in bulkheads and tanks and is then joined to the tank sensor in position. The capillary should not be removed from the indicator. A new indicator would be supplied, complete with the specified length of capillary.

1.3 Bulkhead Fitting

The bulkhead fitting provides the greatest advantage over the competition because it requires a hole in the bulkhead of only 25.4mm instead of 150mm.

At pre-specified distances along the capillary, a solid brass gland is located, having a diameter of 25.4mm. The inner capillary passes through this gland and is sealed along the entire length of the gland to form a pressure tight seal, proof to 100 Bar. The capillary is a continuous single unit and there is no joint.

The bulkhead fitting is illustrated in Appendix 5.

1.4 Indicator

The indicator is weatherproof and is enclosed in stainless steel round housings of 100mm or 160mm.

The dial is hand painted in any required units of mass, volume or depth with up to three scales per indicator. Red lines are available.

Indicators are calibrated individually according to customers' particular requirements as specified by their tank data.

Section 2 - Installation Notes

2.1 600ES & 600SM

2.1.1 Standard

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* is a sealed unit: the sensor assembly, capillary and indicator.

Please observe the following simple precautions during installation.

- 1) Do not disconnect or cut the capillary between the sensor and indicator.
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) The sensor may be coupled directly to the tank or, alternatively, through a suitable valve.
- 5) Carefully unroll the capillary and route towards the indicator.
- 6) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 7) Do not clip or tie capillary to pipes or plant subjected to excessive temperatures or vibration.
- 8) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 9) The tank may now be filled.

2.1.2 Capillary detachable at the Sensor

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly and, separately, the capillary complete with indicator.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the sensor is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 4) Carefully unroll the capillary and route towards the tank area.
- 5) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 6) Do not clip or tie the capillary to pipes or plant subjected to excessive temperatures.
- 7) Having routed the capillary to the tank area, carefully remove the caps and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 8) Connect the union by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 9) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 10) Fit the sensor to the tank or, alternatively, through a suitable valve.
- 11) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 12) The tank may now be filled.

2.1.3 Capillary detachable at Sensor and using Bulkhead Penetration Fitting

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly and, separately, the capillary complete with indicator. In addition, the Bulkhead Penetration Fitting is included.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the sensor is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 4) Carefully unroll the capillary and remove the bulkhead coupling. Route capillary towards the tank area. We recommend that the capillary is supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 5) Do not clip or tie the capillary to pipes or plant subjected to excessive temperatures or vibration.
- 6) Fix the bulkhead coupling on to the bulkhead and remove both hexagon nuts and copper compression rings.
- 7) Pass the free end of the capillary through one of the hexagon nuts, ensuring that the female thread is facing away from the indicator and towards the bulkhead.
- 8) Pass the compression ring over the capillary and through the fitting in the bulkhead.
- 9) Continue to feed the capillary through it until the solid gland is reached.
- 10) Carefully feed the gland into the bulkhead coupling so that an equal length protrudes at either end of the bulkhead coupling.
- 11) Slide the compression ring over the solid gland, followed by the hexagon nut.
- 12) Tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 13) Slide both the compression ring and nut over the end of the capillary again with the female thread facing towards the bulkhead.
- 14) Fit the compression ring over the solid gland and again tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 15) Fix the capillary at intervals of 300mm and repeat the operation at the next bulkhead.
- 16) Throughout the operations, the protective caps on the sensor and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.
- 17) Having routed the capillary to the tank area, carefully remove the caps and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 18) Connect the union by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 19) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 20) Fit the sensor to the tank or, alternatively, through a suitable valve.
- 21) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 22) The tank may now be filled.

2.1.4 Capillary detachable at the Indicator

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly, complete with capillary and, separately, the indicator.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the indicator is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) The sensor may be coupled directly to the tank or alternatively, through a suitable valve.
- 5) Carefully unroll the capillary and route towards the indicator.
- 6) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 7) Do not clip or tie capillary to pipes or plant subjected to excessive temperatures or vibration.
- 8) Having routed the capillary to the indicator area, carefully remove the caps and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 9) Connect the union to the indicator by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 10) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 11) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 12) The tank may now be filled.

2.1.5 Capillary detachable at the Indicator and using Bulkhead Penetration Fitting

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly, complete with capillary and, separately, the indicator. The Bulkhead Penetration Fitting is also included.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the indicator is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) The sensor may be coupled directly to the tank or, alternatively, through a suitable valve.
- 5) Carefully unroll the capillary and remove the bulkhead coupling. Route capillary towards the indicator.
- 6) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of less than 50mm.
- 7) Do not clip or tie capillary to pipes or plant subjected to excessive temperatures or vibration.
- 8) Fix the bulkhead coupling on to the bulkhead and remove both hexagon nuts and copper compression rings.
- 9) Pass the free end of the capillary through one of the hexagon nuts, ensuring that the female thread is facing away from the sensor and towards the bulkhead.
- 10) Pass the compression ring over the capillary and feed the capillary through the fitting in the bulkhead.
- 11) Continue to feed the capillary through it until the solid gland is reached.
- 12) Carefully feed the gland into the bulkhead coupling so that an equal length protrudes at either end of the bulkhead coupling.
- 13) Slide the compression ring over the solid gland, followed by the hexagon nut.
- 14) Tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 15) Slide both the compression ring and nut over the end of the capillary again with the female thread facing towards the bulkhead.
- 16) Fit the compression ring over the solid gland and again tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 17) Fix the capillary at intervals of 300mm and repeat the operation at the next bulkhead.
- 18) Throughout the operations, the protective caps on the indicator and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.
- 19) Having routed the capillary to the indicator area, carefully remove the caps and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 20) Connect the union to the indicator by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 21) **Whenever the capillary is disconnected from the sensor, replace the protectors.**

- 22) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 23) The tank may now be filled.

2.2 600IM

2.2.1 Standard

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* is a sealed unit: sensor assembly, internal stainless steel capillary, tank flange, external capillary and indicator.

Please observe the following simple precautions during installation.

- 1) Do not disconnect or cut the capillary between the sensor and the tank flange or between the tank flange and indicator.
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) Weld the bracket on to the side of the tank. Do not place a welding torch near to the sensor.
- 5) Bolt sensor on to bracket.
- 6) Carefully unroll the internal stainless steel capillary tube and clip it to the inside of the tank.
- 7) Bolt flange to tank top.
- 8) Carefully unroll the external capillary and route towards the indicator.
- 9) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 10) Do not clip or tie capillary to pipes or plant subjected to excessive temperatures or vibration.
- 11) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 12) The tank may now be filled.
- 13) Keep welding torches away from the capillary at all times.

2.2.2 Capillary detachable at the Tank

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly and internal stainless steel capillary complete with tank flange and, separately, the external capillary complete with indicator.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the flange is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) Weld the bracket on to the side of the tank. Do not place welding torch near to the sensor.
- 5) Bolt sensor on to bracket.
- 6) Carefully unroll the internal stainless steel capillary tube and clip it to the inside of the tank.
- 7) Bolt flange to tank top.
- 8) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 9) Carefully unroll the external capillary and route towards the tank area.
- 10) We recommend that the capillary is supported by clipping at distances of 300mm. Bends should be restricted to radii of less than 50mm.
- 11) Do not clip or tie the capillary to pipes or plant subjected to excessive temperatures or vibration.
- 12) Throughout the operations, the protective caps on the flange and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.
- 13) Having routed the capillary to the tank area, carefully remove the protectors and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 14) Connect the union to the flange by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 15) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 16) The tank may now be filled.
- 17) Keep welding torches away from the capillary at all times.

2.2.3 Capillary detachable at the Tank and using Bulkhead Penetration Fitting

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly and internal stainless steel capillary complete with tank flange and, separately, the external capillary complete with indicator. In addition, the Bulkhead Penetration Fitting is included.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the flange is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) Weld the bracket on to the side of the tank. Do not place welding torch near to the sensor.
- 5) Bolt sensor on to bracket.
- 6) Carefully unroll the internal stainless steel capillary tube and clip it to the inside of the tank.
- 7) Bolt flange to tank top.
- 8) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 9) Carefully unroll the external capillary and remove the bulkhead coupling. Route capillary towards the tank area.
- 10) We recommend that the capillary is supported by clipping at distances of 300mm. Bends should be restricted to radii of not less than 50mm.
- 11) Do not clip or tie the capillary to pipes or plant subjected to excessive temperatures or vibration.
- 12) Fix the bulkhead coupling on to the bulkhead and remove both hexagon nuts and copper compression rings.
- 13) Pass the free end of the capillary through one of the hexagon nuts, ensuring that the female thread is facing away from the indicator and towards the bulkhead.
- 14) Pass the compression ring over the capillary and feed the capillary through the coupling in the bulkhead.
- 15) Continue to feed the capillary through it until the solid gland is reached.
- 16) Carefully feed the gland into the bulkhead coupling so that an equal length protrudes at either end of the bulkhead coupling.
- 17) Slide the compression ring over the solid gland, followed by the hexagon nut.
- 18) Tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 19) Slide both the compression ring and nut over the end of the capillary again with the female thread facing towards the bulkhead.
- 20) Fit the compression ring over the solid gland and again tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 21) Fix the capillary at intervals of 300mm and repeat the operation at the next bulkhead.
- 22) Throughout the operations, the protective caps on the flange and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.

- 23) Having routed the capillary to the tank area, carefully remove the protectors and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 24) Connect the union to the flange by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 25) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 26) The tank may now be filled.
- 27) Keep welding torches away from the capillary at all times.

2.2.4 Capillary detachable at the Indicator

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

The *Tank Gauging System* consists of two parts: the sensor assembly, internal stainless steel capillary and tank flange complete with external capillary and, separately, the indicator.

Please observe the following simple precautions during installation.

- 1) The capillary coupling on the indicator is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) Weld the bracket on to the side of the tank. Do not place welding torch near to the sensor.
- 5) Bolt sensor on to bracket.
- 6) Carefully unroll the internal stainless steel capillary tube and clip it to the inside of the tank.
- 7) Bolt flange to tank top.
- 8) Carefully unroll the external capillary and route towards the indicator.
- 9) We recommend that the capillary is supported by clipping at distances of 300mm. Bends should be restricted to radii of less than 50mm.
- 10) Do not clip or tie the capillary to pipes or plant subjected to excessive temperatures or vibration.
- 11) Throughout the operations, the protective caps on the indicator and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.
- 12) Having routed the capillary to the indicator area, carefully remove the protectors and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**
- 13) Tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 14) Slide both the compression ring and nut over the end of the capillary again with the female thread facing towards the tank penetration fitting.
- 15) Fit the compression ring over the solid gland and again tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 16) Connect the union to the indicator by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 17) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 18) The tank may now be filled.
- 19) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 20) Keep welding torches away from the capillary at all times.

2.2.5 Capillary detachable at the Indicator and using Bulkhead Penetration Fitting

The *GWK Series 600 Self Powered Contents Gauges* have been carefully designed to provide reliable and accurate measurement and trouble free service.

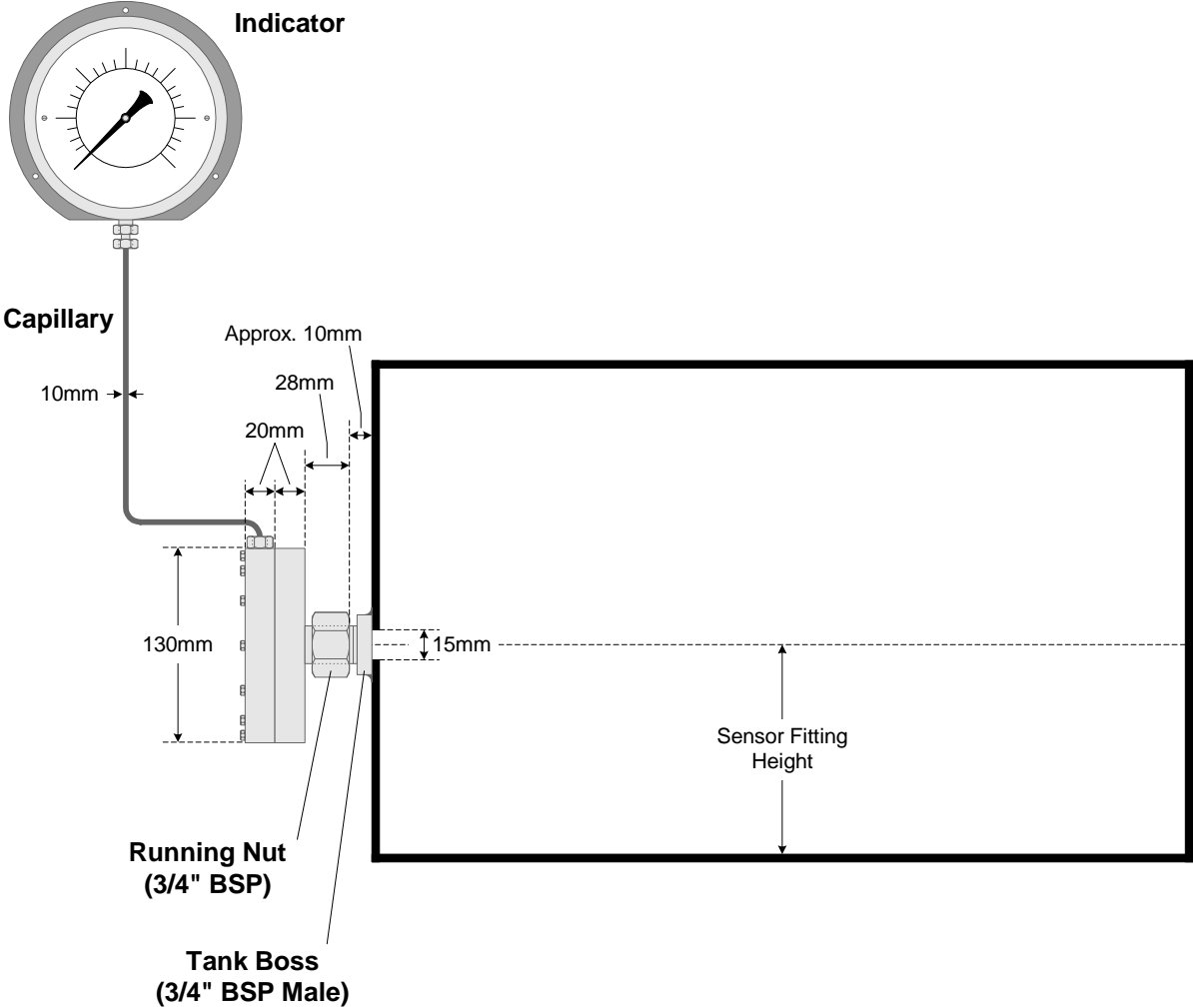
The *Tank Gauging System* consists of two parts: the sensor assembly, internal stainless steel capillary and tank flange complete with external capillary and, separately, the indicator. The Bulkhead Penetration Fitting is also included.

Please observe the following simple precautions during installation.

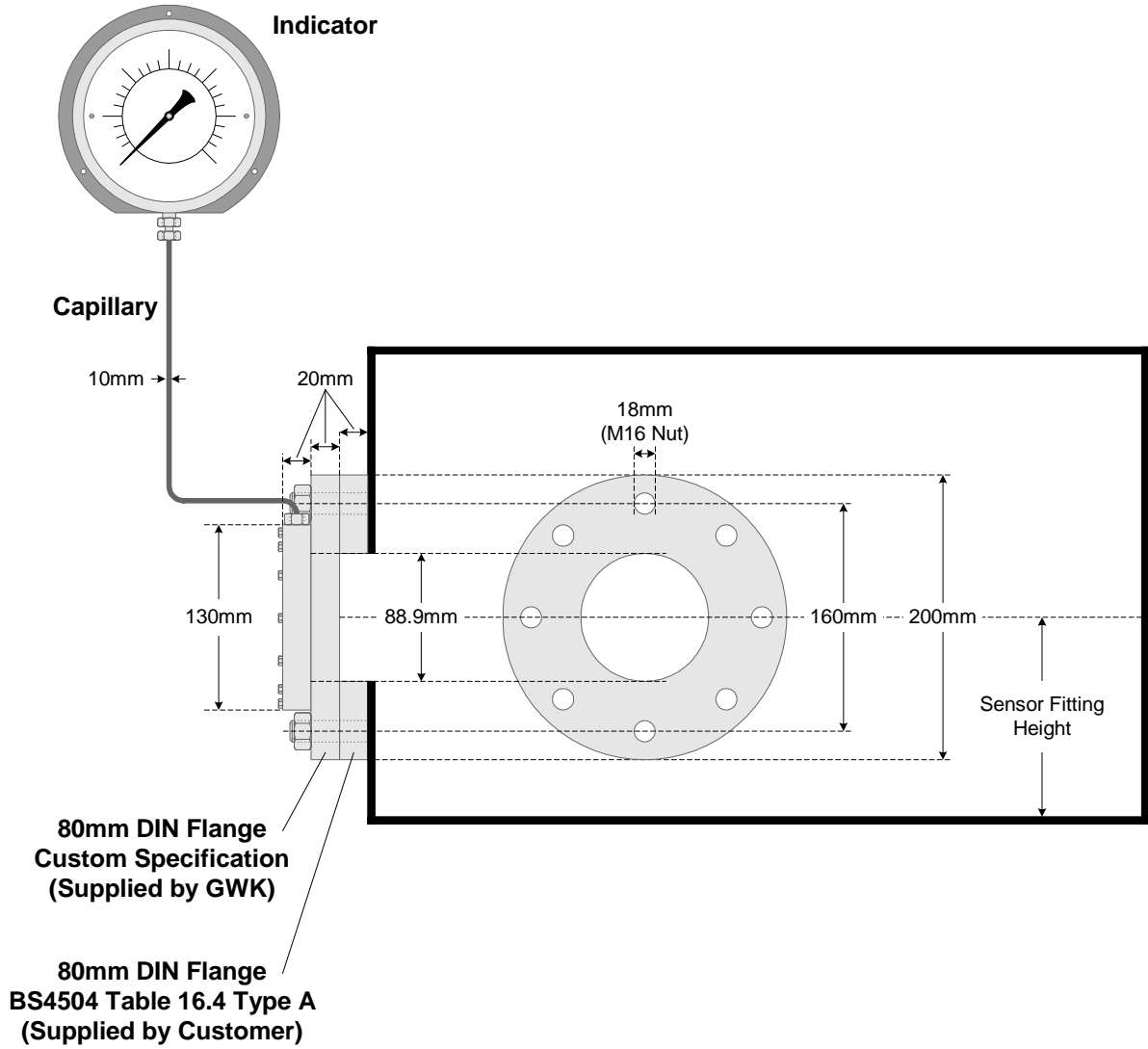
- 1) The capillary coupling on the indicator is protected by a blue plastic cap. The end of the capillary has a black rubber protective cap. **Do not remove these caps until the indicator has been installed and the capillary routed to the tank area.**
- 2) At the time of installation, the tank must be empty.
- 3) The calibration of the instrument will not be affected by the elevation of the indicator relative to the tank sensor but it is important to ensure that the height of the sensor above the tank base is the same as that specified on the order.
- 4) Weld the bracket on to the side of the tank. Do not place welding torch near to the sensor.
- 5) Bolt sensor on to bracket.
- 6) Carefully unroll the internal stainless steel capillary tube and clip it to the inside of the tank.
- 7) Bolt flange to tank top.
- 8) Carefully unroll the external capillary and remove the bulkhead coupling. Route capillary towards the indicator.
- 9) We recommend that the capillary be supported by clipping at distances of 300mm. Bends should be restricted to radii of less than 50mm.
- 10) Do not clip or tie capillary to pipes or plant subjected to excessive temperatures or vibration.
- 11) Fix the bulkhead coupling on to the bulkhead and remove both hexagon nuts and copper compression rings.
- 12) Pass the free end of the capillary through one of the hexagon nuts, ensuring that the female thread is facing away from the sensor and towards the bulkhead.
- 13) Pass the compression ring over the capillary and feed the capillary through the coupling in the bulkhead.
- 14) Continue to feed the capillary through it until the solid gland is reached.
- 15) Carefully feed the gland into the bulkhead coupling so that an equal length protrudes at either end of the bulkhead coupling.
- 16) Slide the compression ring over the solid gland, followed by the hexagon nut.
- 17) Tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 18) Slide both the compression ring and nut over the end of the capillary again with the female thread facing towards the bulkhead.
- 19) Fit the compression ring over the solid gland and again tighten the hexagon nut so as to swage the compression ring on to the solid gland.
- 20) Fix the capillary at intervals of 300mm and repeat the operation at the next bulkhead.
- 21) Throughout the operations, the protective caps on the indicator and capillary must remain in position so that no foreign matter is allowed to contaminate the end of the capillary.
- 22) Having routed the capillary to the indicator area, carefully remove the protectors and fit the "O" ring seal on to the capillary union. **The "O" ring is stored on the gauge glass.**

- 23) Connect the union to the indicator by hand, until compression of the "O" ring is felt and then tighten home the coupling with a spanner by 1/8 of a turn only.
- 24) The indicator houses a precision movement, which has been carefully calibrated to suit your tank specification. It should be mounted with care so that it is protected from mechanical damage by plant or machinery.
- 25) The tank may now be filled.
- 26) **Whenever the capillary is disconnected from the sensor, replace the protectors.**
- 27) Keep welding torches away from the capillary at all times.

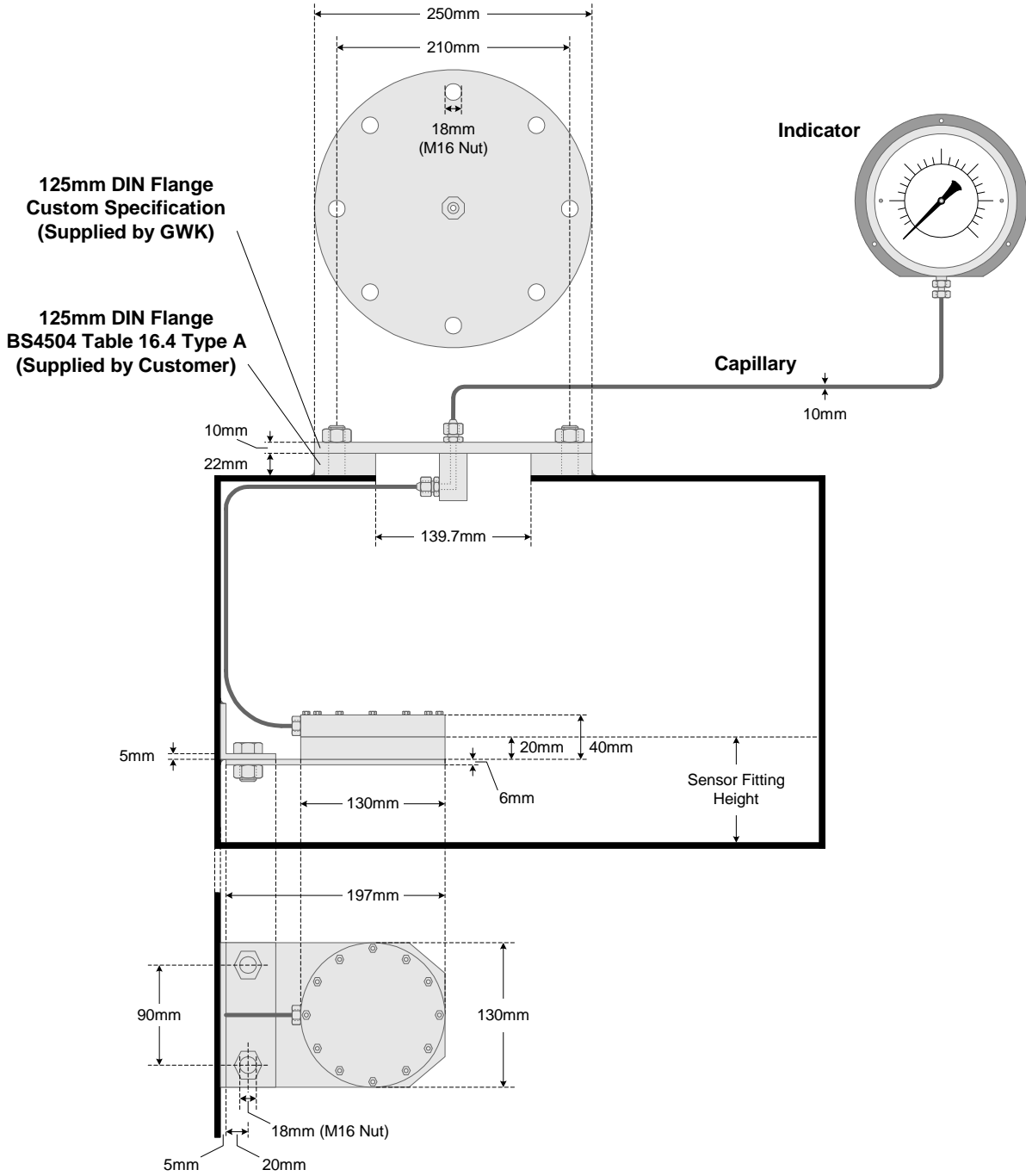
Appendix 1 - 600ES



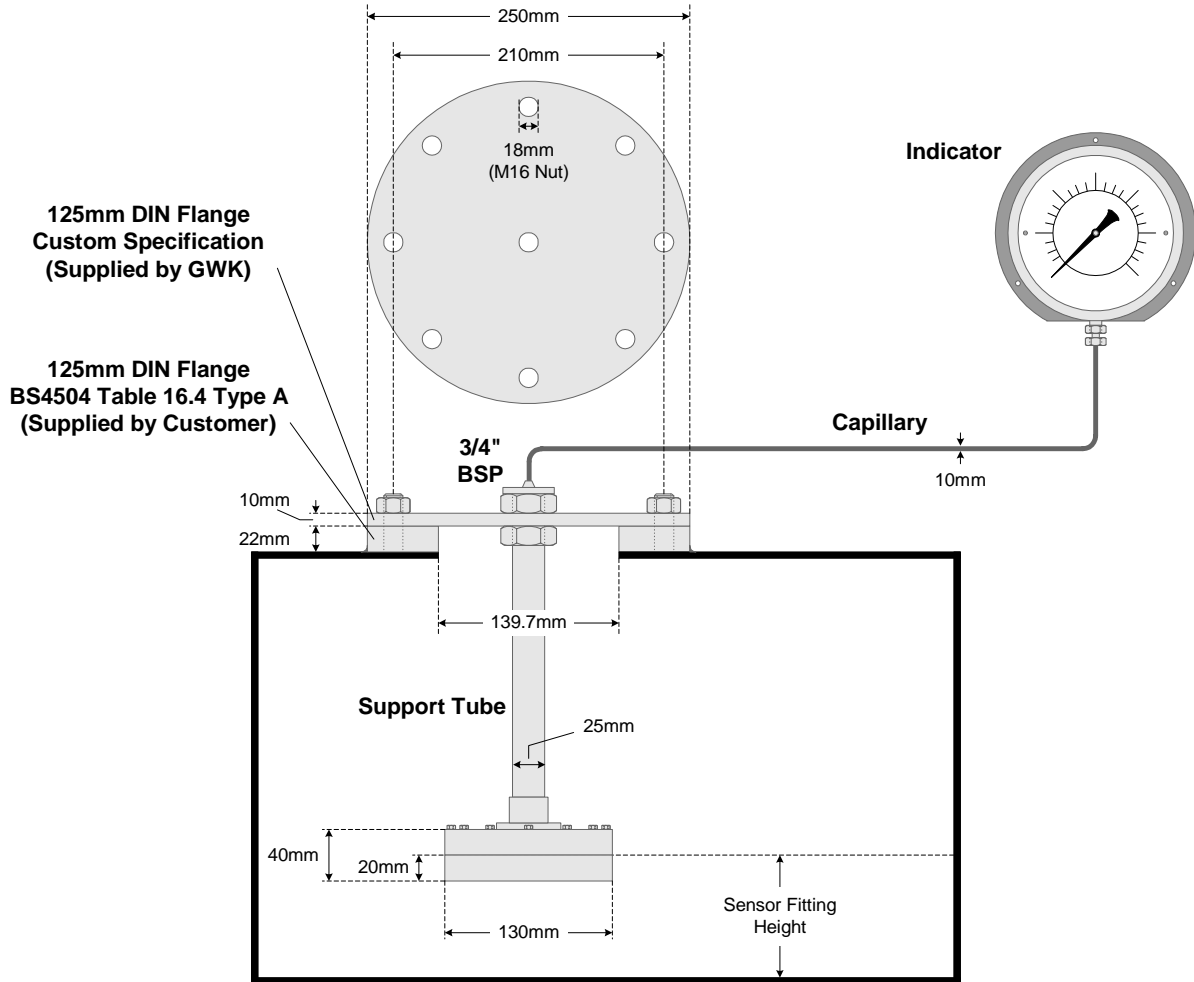
Appendix 2 - 600SM



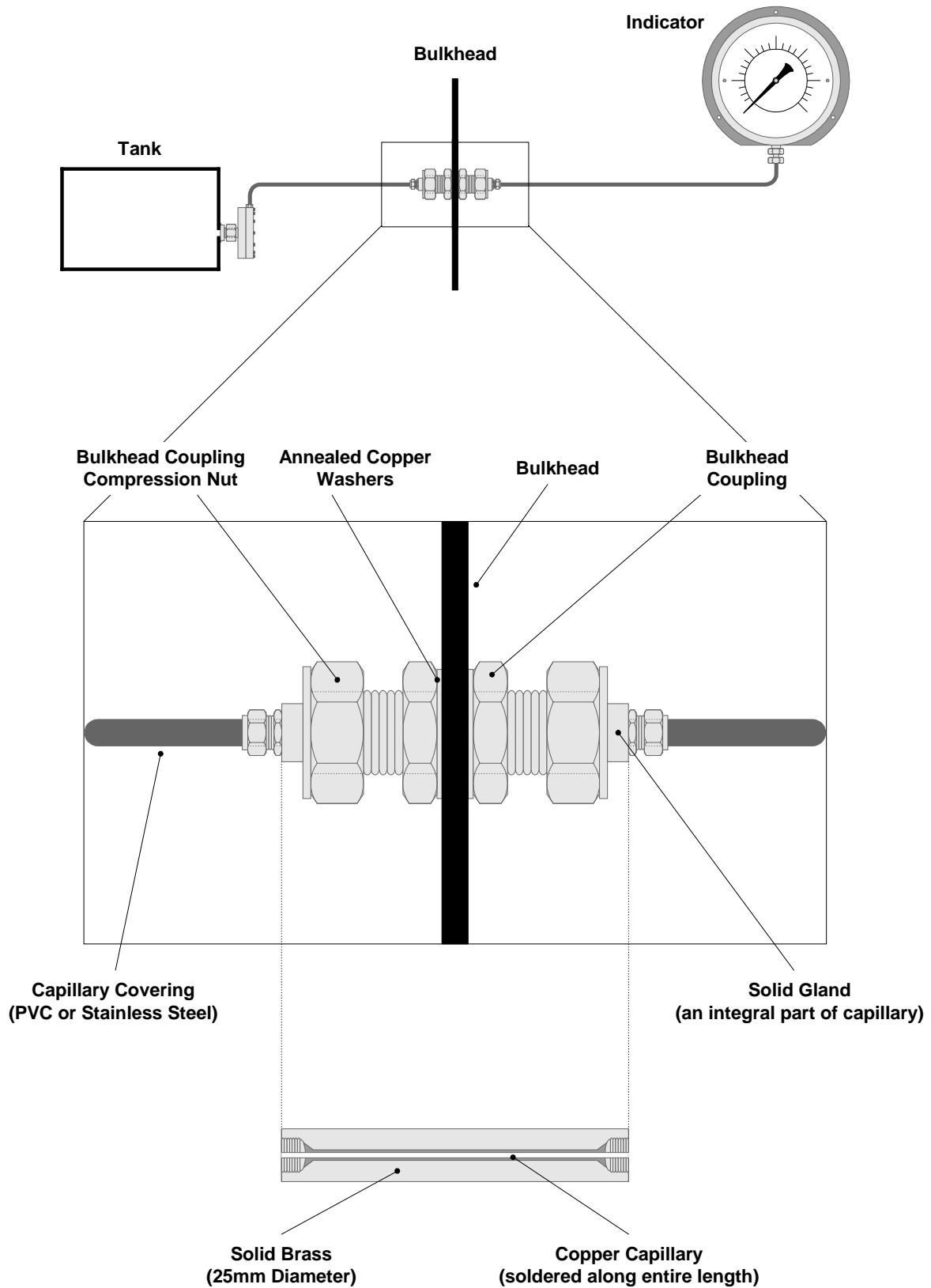
Appendix 3 - 600IM



Appendix 4 - 600IS

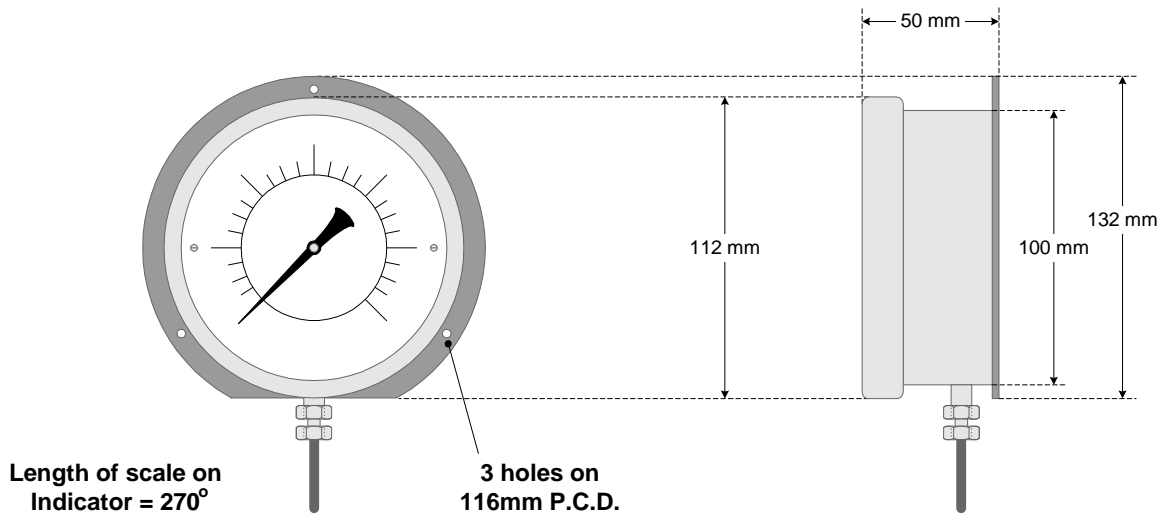


Appendix 5 - Bulkhead Penetration Fitting

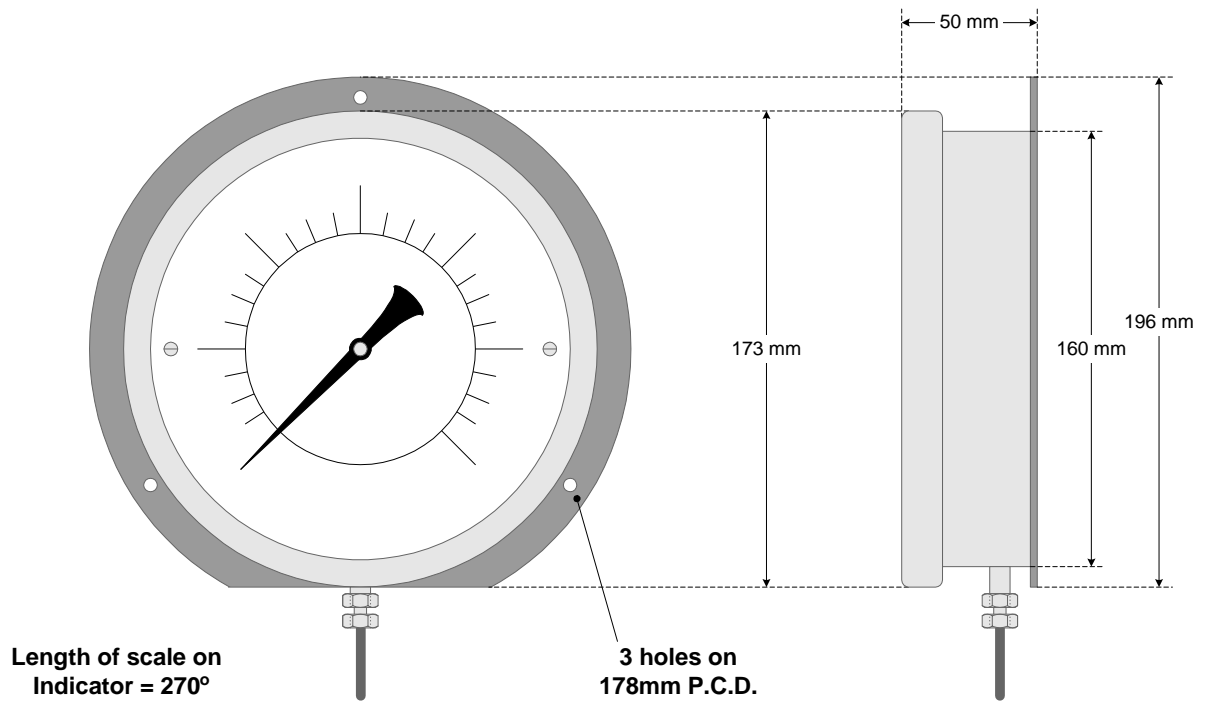


Appendix 6 - Wall Mounted Indicators

100mm



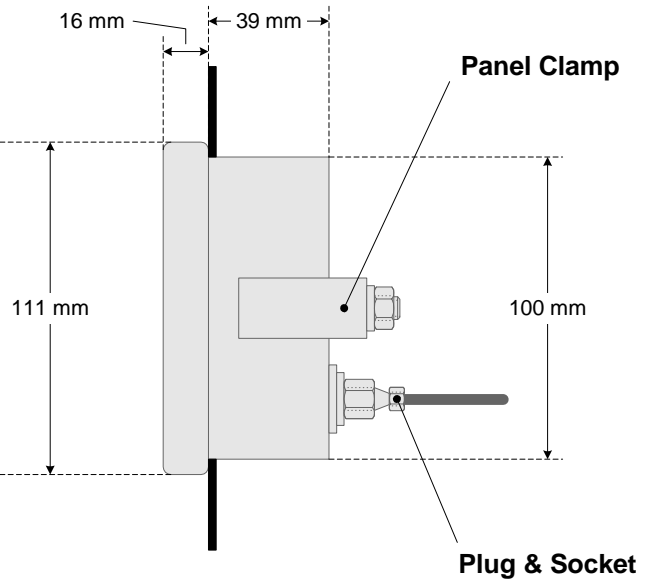
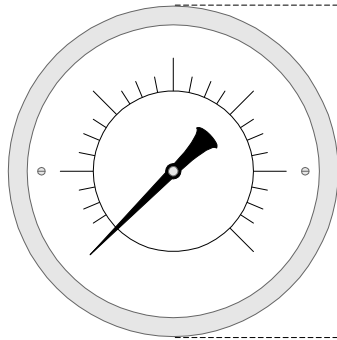
160mm



Appendix 7 - Flush Panel Mounted Indicators

100mm

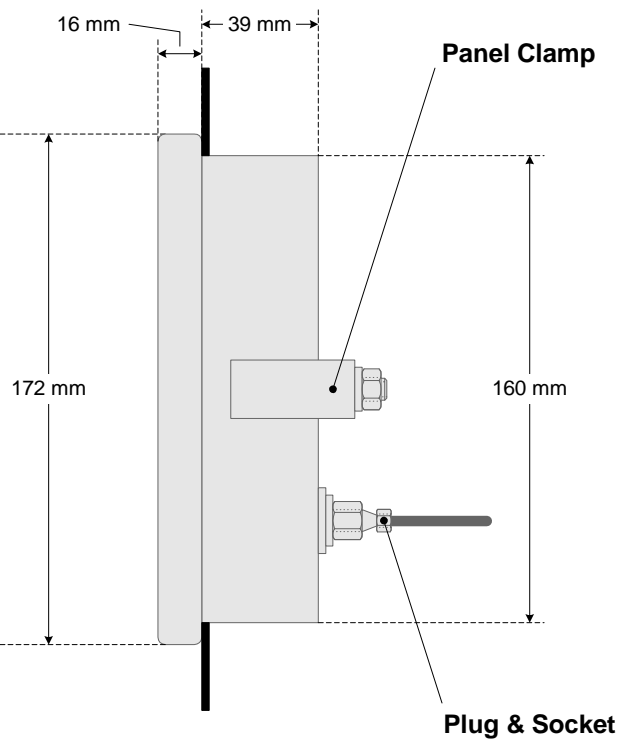
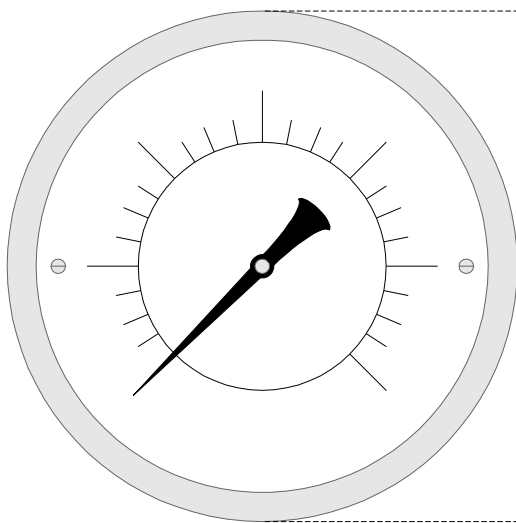
Case Material - Stainless Steel



Length of scale on Indicator = 270°

160mm

Case Material - Stainless Steel



Length of scale on Indicator = 270°