

Installation and Maintenance Instruction Manual

PLATINUM SERIES TRANSMITTERS



In the following configuration:

- DP55 Differential pressure transmitter PLATINUM SERIES



DP55

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1 General remarks

1.1 Purpose of this Manual

This Operating Manual contains fundamental and essential advice to be followed for the installation, operation and servicing of the device. It must be read without fail before assembly and start-up of the device by the fitter, the operator and the specialist personnel responsible for the device. This Operating Manual must be available at the point of use at all times.

The following sections about general safety information and also the following specific advice regarding the intended purposes (Section 2), and through to disposal (Section 17) contain important safety information which, if not followed, may result in risks for people and animals, or to property and buildings.

1.2 Symbols



Warning!

This indicates a possibly hazardous situation where failing to follow advice may result in risks to people, animals, the environment and buildings.



Information!

This emphasizes key information for efficient, fault-free operation.

1.3 Limits of liability

Failure to respect this safety information, the envisaged uses or the limit values relating to use indicated in the technical data for the device may result in risk or to injury to people, the environment or the plant.

Claims for compensation for damage against the device supplier are excluded in such an eventuality.

1.4 Copyright

This Operating Manual may only be copied and passed on as a complete document with the special permission of the publisher.

1.5 Warranty

For the product described here, we offer a warranty pursuant to Section 6 Guarantee in Respect of Defects in our *General Terms and Conditions* of Delivery and Payment.

1.6 Precautions and warnings

- Check if the specifications of the transmitter meet the needs of the process conditions
- When the PLATINUM SERIES DP55 is used as a level transmitter, be aware of the place where the transmitter is mounted. Here are some suggestions:
 1. DO NOT mount a level transmitter in- or near filling or discharging pipes.
 2. In case of automatic cleaning systems or hand cleaning: never point the water jets on the diaphragm, take necessary steps to avoid this. Guarantee will not be granted.
- When the PLATINUM SERIES DP55 is used as a pressure transmitter, be aware of the following points:
 1. Rapid closing valves in combination with high flow velocity will cause water hammer(spikes) and can destroy the transmitter. DO NOT mount a transmitter near such valves, always a few pipe bends away up or down stream (avoid suction).
 2. Install a pressure transmitter a few pipe bends away from pumps, as well on the suction or pressure side of the pump
- The diaphragm of the transmitter is protected with a special protection cap. Protect the diaphragm until installation takes place, to prevent damaging of the diaphragm.
- As soon as the wiring is brought inside through the cable gland and connected to the terminal board, make sure the cable gland is tightly fixed, so that moisture cannot enter into the electronic housing.
- The covers must be fully engaged, so that moisture cannot ingress into the electronic housing. The covers must only be capable of being released or removed with the aid of a tool.

1.7 Manufacturer's address, customer services

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Max-Planck-Strasse 1
D-52499 Baesweiler, Germany

Tel.: +49 (0) 2401/808-888
Fax.: +49 (0) 2401/808-999
E-mail: customer.service@ashcroft.com
Web: www.ashcroft.eu

2 Safety

2.1 General sources of hazards

Pressure transmitters are pressurized parts where failure can result in hazardous situations. The selection of pressure transmitter should be made in accordance with the applicable national and international standards.

2.2 Use in accordance with intended purpose

The devices are only to be used for the intended purpose as described by the manufacturer.

The PLATINUM SERIES DP55 transmitters is a high end pressure, differential pressure and flow transmitters based upon a piezoresistive silicon sensor, with a very high burst pressure. Pressure of the medium applied on a sensor element, creates a very small deflection of the silicon substrate and bridge network. The resulting strain in the silicon resistors causes a change in the bridge resistance that is proportional to the pressure/differential applied. The transmitter electronics detects this change in bridge resistance and converts it into 4-20 mA. The amplifier system is based on a single microprocessor, which ensures a perfect linearity in the 4-20 mA output, all within an accuracy of 0.075 % or 0.065%(optional).

The devices are used for pressure, differential pressure and flow measurements in different applications. For each use scenario, the corresponding set-up regulations must be respected. If used in explosion risk areas, the following conditions are to be respected for the individual finishes.

2.3 Operator's responsibility

Safety instructions for proper operation of the device must be respected. They are to be provided by the operator for use by the respective personnel for installation, servicing, inspection and operation. Risks from electrical energy and from the released energy of the medium, from escaping media and from improper connection of the device must be eliminated. The details for this are to be found in the corresponding applicable set of regulations, such as DIN EN, UVV (accident prevention regulations) and in sector-specific instances of use (DVGW, Ex- GL, etc.) the VDE guidelines and the regulations supplied by local utilities companies.

The device must be taken out of service and secured against inadvertently being restarted, if the presumption is that risk-free operation is no longer possible (see Section 16: Faults).



Conversion works or other technical alterations to the device by the customer will violate the approval for hazardous area and are not permitted. This also applies to installation of spare parts. Possible conversions or alterations may only be carried out by the manufacturer.

The operational safety of the device is only guaranteed where it is used for its intended purpose. The specification of the device must be adapted to the medium used in the plant. The limit values indicated in the technical data must not be exceeded.

The safety information detailed in this Operating Manual, existing national regulations for accident prevention, and the operator's internal regulations regarding working, operations and safety must be respected.

The operator is responsible for all specified servicing, inspection and installation works being carried out by authorized and qualified specialists.

2.4 Staff qualifications (target group assessment)

The device may only be installed and started up by specialist staff who are familiar with installation, start-up and operation of the product.

Specialist staff are people who are able to assess the work assigned to them on the basis of their specialist training, their knowledge and experience and their knowledge of the relevant standards, and can identify possible risks.

For devices in explosion-protected configuration, these staff must have been trained or instructed in, or be authorized for, working on explosion-protected devices in potentially explosive plants.

2.5 Signs/Safety markings

The pressure transmitter and its surrounding packaging carry markings. These markings show the article number, measurement range and manufacturer. The pressure transmitter can be provided with additional signs and safety markings advising on special conditions:

- Advice on the filling liquid
- Advice on calibration
- Safety advice for flush diaphragm

2.6 Environmental protection

This device contains a small amount of silicone oil or a foodgrade oil(Neobee M20). The provisions set out in the REACH regulation on production and use of chemicals are to be respected, and the relevant safety data sheets from the manufacturers of the chemicals are available on our website for download.

3 Certificates/ details

3.1 CE / EMC – Rules

All PLATINUM SERIES DP55 transmitters are manufactured in accordance with the RFI / EMC directives and comply with the CE standard. All transmitters are fitted with RFI filters, which provide optimum, trouble-free operation. Our products are in conformity with EMC-Directive 2004/108/EC based on test results using harmonized standards.

3.2 Traceability year of manufacturing

The year of manufacturing of the transmitter can be traced as follows: take the first two numbers from the serial number that is engraved in the transmitter and add 1970 to it.

For example: if the serial number is 4502123. The year of manufacturing is 1970 + 45 = 2013.

4 Technical data

4.1 Specifications

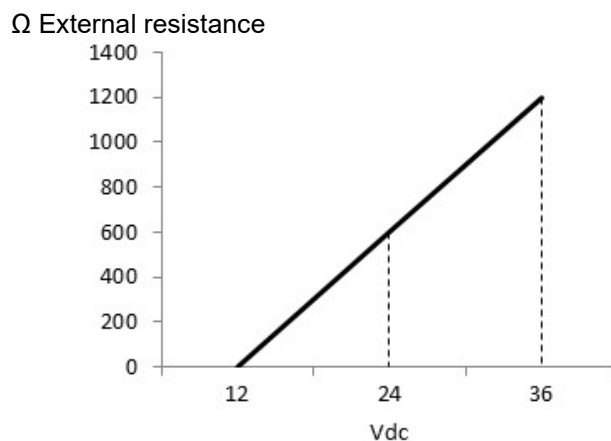
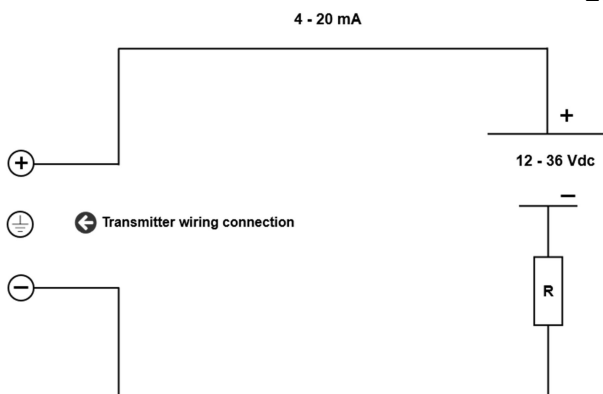
Manufacturer	Ashcroft Instruments GmbH			
Instrument	PLATINUM SERIES DP55			
Output	4-20 mA Optional: HART® Protocol			
Power Supply	Standard : 12 – 36 Vdc HART® : 17 – 36 Vdc (Standard) min. 250 Ω			
Accuracy ¹	0,075% - (Turn down 10:1) 0,1% - (Turn down 20:1) 0,15% - (Turn down 40:1) 0,005%xTD - (Turn down>40:1)			
Ranges	Code	Adjustable span ranges		Max. overpressure
	DP55 60MB	0-10 mbar	0-60 mbar	160 bar
	400MB	0-10 mbar	0-400 mbar	160 bar
	2BR	0-20 mbar	0-2000 mbar	160 bar
	20BR	0-0,2 bar	0-20 bar	160 bar
Process Temperature ²	DP55 Standard	-20°C to +80°C (-4°F to 176°F) (Optional 100°C)		
Temperature effect	0,015% / K			
Ambient Temperature	DP55 Standard	-20°C to +70°C (-4°F to 158°F)		
Damping	0,0 sec. till 25,00 sec. Standard damping: 0,00 sec.			
Protection grade	IP66			
Material	Housing	AISI 304 (Optional AISI 316)		
	"wet" parts	AISI 316 L and Viton O-Ring(Other materials on request)		

- To achieve the highest accuracy, always choose the instrument range closest to the required Calibrated span
 . Example: Required Calibrated range 0 – 300 mbar, choose 400MB
- For higher temperatures use other kind of pressure transmitters. Contact Ashcroft Instruments for information.

4.2 External Load

External loads must be placed in the negative side of the 2-wire loop. The minimum power supply is based on the total circuit resistance. The maximum external load (R_I max.) for 24 Vdc will be 600 Ω (Ohm). At higher power supply, the external load can be up to max. 1200 Ω / 36 Vdc.

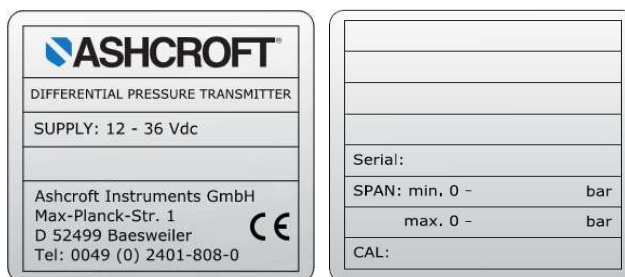
$$R_I \text{ max.} = \frac{\text{Voltage} - 12 \text{ V (min. voltage)}}{20 \text{ mA}}$$



With a loop resistance of 250 Ω a power supply of at least 17 Vdc must be used.

5 Labeling

The label with the serial number and type designation is located on the outside of the housing. The materials identifier is encoded in the type designation.



6 Construction and function

The PLATINUM SERIES DP55 transmitters is a high-end pressure, differential pressure and flow transmitter based upon a piezoresistive silicon sensor, with a very high burst pressure. The sensor element is mounted in a stainless steel body.

Pressure on the sensor element creates a very small deflection of the silicon substrate and bridge network. The resulting strain in the silicon resistors causes a change in the bridge resistance that is proportional to the pressure/differential pressure applied. The transmitter electronics detects this change in bridge resistance and converts it into 4-20 mA. The amplifier system is based on a single microprocessor, which ensures a perfect linearity in the 4-20 mA output, all within an accuracy of 0.075 % or 0.065 % (option).

6.1 Description of PLATINUM SERIES DP55

The DP55 is specially designed as a differential pressure transmitter. The wetted parts are standard made of AISI 316L, other diaphragm materials are available, like Hastelloy C and Tantalum. The process connections are standard fitted with 1/4" NPT female thread. Oval flanges can be provide as an option for 1/2" NPT (f) process connections. All process connections meet the requirements of IEC 61518.

All transmitters are fully temperature compensated, which means that various process temperatures have nearly no effect on the accuracy of the output signal. When a failure occurs, the transmitter is repairable. However, for optimum accuracy the transmitter has to be send back to the factory.

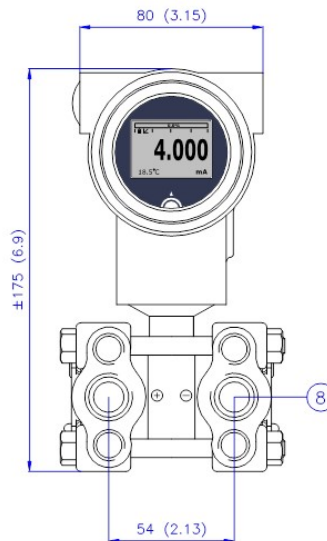
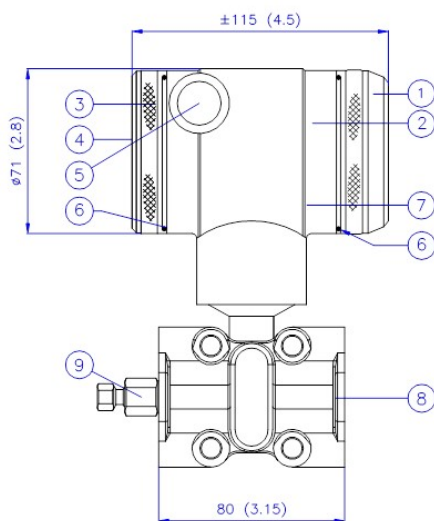
DP55 with separate diaphragm seals

The DP55 is also available with separate diaphragm seals. Standard the wetted parts are made of AISI 316L, other materials like Hastelloy C are available as an option.

Drain and Vent valves

As standard the DP55 is supplied with two drain valves. They can be screwed from the DP55 body to drain or vent the process. These valves must be kept clean. In case the drain valves are not used closing/stopping bolts must be used.

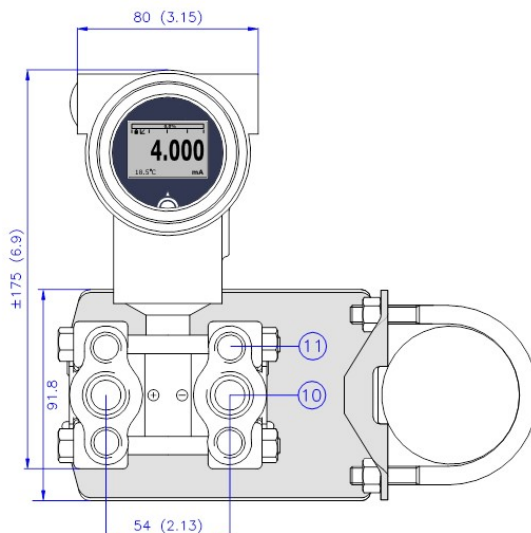
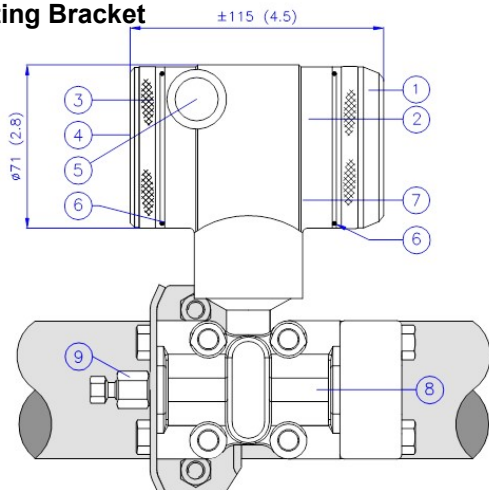
DP55



Front view: Transparent cover, option DG (extra price)

Description	Material	Description	Material
① Cover	St.St. 304	⑥ O-Ring	EPDM
② Display with navigation button		⑦ Electronics housing	St.St. 304
③ Cover	St.St. 304	⑧ Body with process connection: 1/4-18 NPT f	St.St. 316
④ Venting	PA	⑨ Vent Valve	St.St. 316
⑤ M20 x 1,5 cable entry (without gland)*			

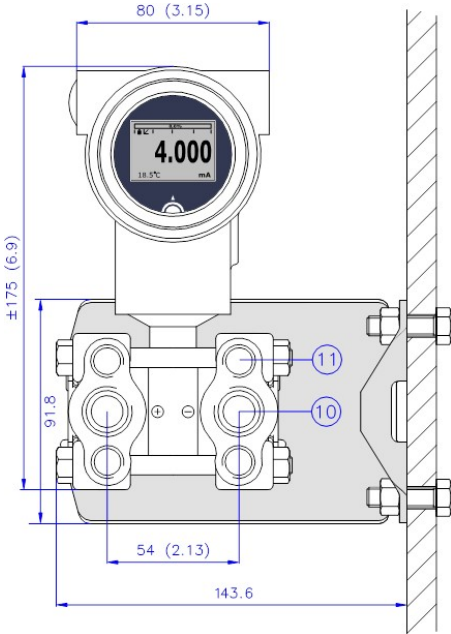
DP55 Mounting Bracket



Front view: Transparent cover, option DG (extra price)

Description	Material	Description	Material
① Cover	St.St. 304	⑦ Electronics housing	St.St. 304
② Display with navigation button		⑧ Body with process connection: 1/4-18 NPT f	St.St. 316
③ Cover with venting	St.St. 304	⑨ Vent Valve	St.St. 316
④ Venting	PA	⑩ Process connection	St.St. 316
⑤ M20 x 1,5 cable entry (without gland)*		⑪ 7/16 -UNF Internal thread	St.St. 316
⑥ O-Ring	EPDM		

DP55 Wall Mounting



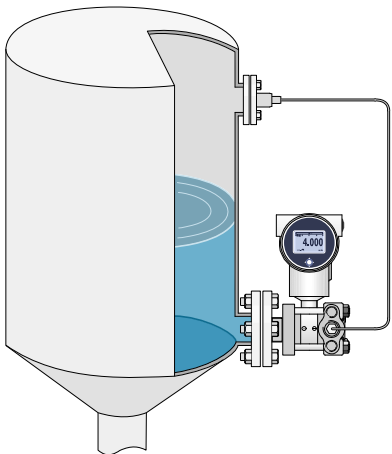
* As standard the DP55 will be supplied with two cable entries M20 x 1.5. A cable gland can be supplied on request (extra price).

6.2 Accessories

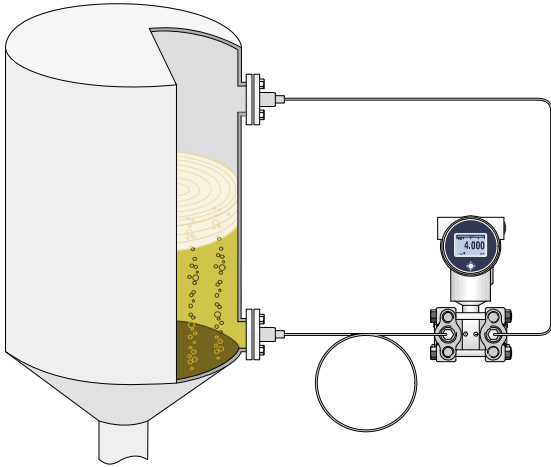
Please contact the manufacturer regarding special tools and accessories.

6.3 Applications

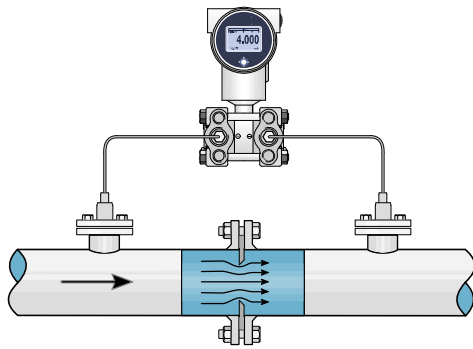
The DP55 can be used in a variety of applications as differential pressure, level and flow measurement.



Differential pressure measurement with flanged connection and chemical seal.



Differential pressure measurement with chemical seals.



$\sqrt{\text{(SQUARE ROOT)}}$
 Flow measurement, for example:
 Orifice flanges, Pitot tubes and Venturi
 tubes.

7 Transport

7.1 Safety

The device should be protected against the effects of knocks and impacts. The device should only be transported in the packaging provided, to protect against damage. The device should only be transported in a clean condition (free of residues of measuring media).

7.2 Transport inspection

The delivery must be checked for completeness and damage during transport. In the event of damage during transport, the delivery must not be accepted, or only accepted subject to reservation of the scope of the damage being recorded and, if necessary, a complaint initiated.


7.3 Storage

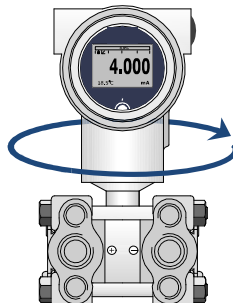
The device must be stored in dry, clean conditions, within a temperature range of -20 to +70 °C (-20 to +31°C for T6), protected against direct exposure to sunlight and protected against impact damage.

8 Assembly/Installation

The Diaphragm, Flange or separate diaphragm seals of the transmitter are protected with a special protection cap. It is advisable to only remove this protection until installation takes place. Do not damage the diaphragm, capillaries or any part of the process connection. **Do not dismantle the process connection (Sensor body).**

8.1 Transmitter housing (fully rotatable)

The transmitter housing can be fully rotated both ways 360° degrees. Untighten the hexagon screw  on the outside of the enclosure. Rotate the transmitter housing to the right position and fix the position by tightening the hexagon screw on the outside of the enclosure. The construction prevents the housing from being rotated too far. Where necessary the display can also be rotated separately from the transmitter housing to the right position for most optimum readout (see Section 8.8 Rotatable display)



8.2 Manifolds

The DP55 can be supplied with a 3 or a 5 way manifold. The manifold separates the transmitter from the actual process. The advantage of a manifold is simple installation and easy maintenance without interrupting the process. This means higher system availability and even simpler commissioning or maintenance purposes. If a manifold is applied, the process connection will change from ¼" NPT (f) to ½" NPT (f) thread.



8.3 Mounting Position

When the transmitter is mounted horizontally, the cable gland must be pointed downwards.

8.4 Mounting Position Effect

All transmitters are calibrated in vertical position. If the transmitter is mounted up, there is a zero shift (e.g. 4.02 mA instead of 4 mA). If the transmitter is mounted down, there is a zero shift (e.g. 3.98 mA instead of 4 mA). After installation of the transmitter the zero must be set to 4.00 mA with "P103" in the programming mode (see Section 12.3). This will not affect the span.

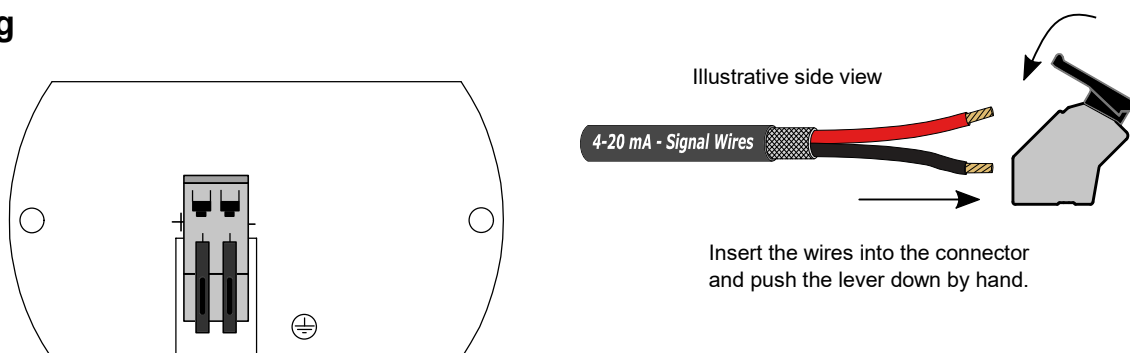
8.5 Process connection

Before mounting of the transmitter, be aware of the correct position of the high and low pressure side. The process connection is clearly marked with the symbols + and -.

8.6 Calibration

All transmitters are fully calibrated at the factory, to customer specified range. If calibration is not specified, the transmitter will be calibrated at the maximum span.

8.7 Wiring



The figure above shows the wiring connection of the transmitter. The 2-wires must be connected to + and - on the terminal board. The wiring terminals can be operated without a screwdriver. The opening levers of the terminals can be lifted and pressed down by hand. Lift the opening levers of the terminals and insert the corresponding wires. Press down the levers by hand, the terminal spring will close and the wire is clamped.

Optionally a secondary 4-20 mA output is available on request. The transmitter must be connected with standard two-wire shielded cable. Do not run signal wiring in open trays with power wiring, or near heavy electrical equipment (Frequency controllers or heavy pumps). Reversing the polarity will not damage the transmitter, but the transmitter will not function until the wires are properly connected.

The transmitter must always be connected to ground. In case the process connection is already connected to ground (for example: by tank or pipe line) do not connect the instrument to ground. Please ensure that the instrument is not connected to ground twice to prevent an Earth loop.



Please ensure that the transmitter is not connected to ground twice to prevent an earth loop.

8.8 Rotable Display

The display from PLATINUM SERIES DP55 is fully rotatable. To rotate the display, place a small screw driver into the recess on top of the display. Turn it by hand by moving the screw driver into the desired direction, use the other hand to guide this movement to avoid any damages. The display can be turned both left and right.



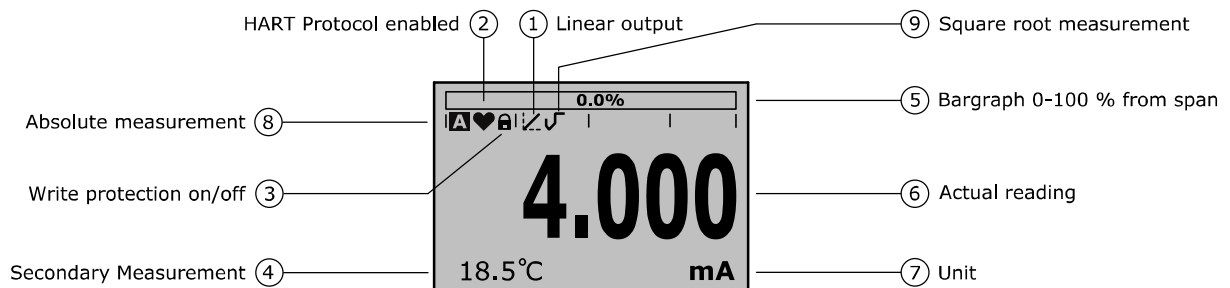
8.9 Subsequent relocation of the transmitter (by the customer)



Recommendation: Do not remove the transmitter from one metering point and fit it in a different place, as there is a risk of the measuring media being mixed, with unforeseeable chemical reactions.

9 Reading on the display

When the transmitter is powered, a flash screen with the name of the transmitter PLATINUM SERIES and the software version appears for a few seconds. After this the home screen will show the measured value setting as set in the factory.

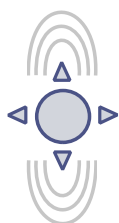


EXPLANATION OF SYMBOLS:

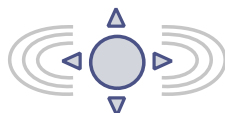
1. – **Linear output:** Displays when any form of linearization is applied. A straight line means no linearization is applied. When a linearization is applied a curve will be displayed.
2. – **HART® protocol:** Displays a HART symbol, when HART protocol option is available.
3. – **Write protection on/off:** Displays if protection against adjustments and configuration is on or off
4. – **Secondary Measurement:** Displays a secondary chosen measurement.
5. – **Bargraph 0-100 % from span:** Displays the percentage of the measured span.
6. – **Actual reading:** Displays the current measurement in mA, percentage or a selectable unit.
7. – **Unit:** Displays the selected unit.
8. – **Absolute Sensor:** Appears when the measurement is in absolute range.
9. – **Square root:** Appears when the flow measurement is enabled.

10 Functions of Push Buttons

The PLATINUM SERIES has a multifunctional display where different values can be displayed simultaneously. The display is equipped with a backlight. The entire menu is controlled by a navigation button. The navigation button has the following possibilities of movement: up, down, left, and right. The navigation button needs to be pushed when conformation or saving is needed.



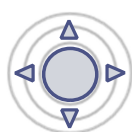
Move the navigation button up or down to browse through various menus. These movements can be distinct in choices of: program points, navigation through menu's and increase or decrease measurement value's.



Move the navigation button left or right to navigate horizontally through the menu or positions on the display.



It is always possible to return to the previous menu. Move the navigation button to the left to return to the previous menu.



By pushing the navigation button each choice will be **confirmed** or a setting will be **saved**.

11 Programming points(P100-P115)

PROGRAM POINT	NAME	FUNCTION
P100	Menu-Exit menu	Start and exit
P101	ZERO value	Zero adjustment (ZERO 4 mA) with or without test pressure
P102	SPAN value	Span adjustment (SPAN 20 mA) with or without test pressure
P103	MOUNT correction	Cancel mounting position effect (4 mA)
P104	UNITS	Selection of engineering unit to be displayed
P105	REVERSE mA	Output selection 4-20 mA or 20-4 mA
P106	DAMPING	Adjustable damping (0,00 till 25,00 s)
P107	LANGUAGE	Language choice between: English, Dutch, German, Russian, Polish and French.
P108	DEVICE SETUP	Configuration of: Protection, Alarm, Backlight, Temperature, Secondary value, (Set time and HART Version, only when HART protocol is present.)
P109	READOUT	Readout options on display: Current, unit, percentage and temperature
P110	CURRENT SIMULATION	Current simulation 4-20 mA (Stepwise or free adjustable)
P111	TANK LINEARIZATION	Configuration for tank linearization
P112	BURST MODE	Configuration for burst mode
P113	INFORMATION	Contact information of Ashcroft Instruments, made settings, and software revision
P114	TRANSFER FUNTION	Flow configuration: Linear and ($\sqrt{\quad}$) Square Root
P115	FACTORY	Only available for the manufacturer
P116	FACTORY	Only available for the manufacturer

12 Explanation of Programming points P101 to P116

The following points can be adjusted by means of the three push buttons

12.1 P101 Zero Adjustment (4 mA)

The transmitter is set to 0 mbar at atmospheric pressure.

The **ZERO** can be adjusted at a lower or higher point. This will be explained step by step by an example.

Example: Increase ZERO till 100 mBar.

1. The measuring unit of the transmitter is set to mBar. If not this can be selected by choosing the right measuring unit in program point **P104 – UNITS**
2. Navigate to program point **P101 - ZERO Value**, and push the navigation button to enter the menu.
3. Two choices appear on the screen: “**set manual**” and “**use process**”
Set manual = Configuration without test pressure.
Use process = Configuration with applied pressure.
4. Choose “**set manual**”, +000.0 (mBar) will appear on the display.
5. Increase this value with the navigation button to 100 mBar, push to confirm, and select **SAVE** to save the setting.
6. The transmitter will return to the home screen. The measurement value at atmospheric pressure is now -100 mBar. At an applied pressure of 100 mbar the transmitter will display 0 mbar.

The menu zero adjustment also has the choice of “**use process**”. The transmitter can be adjusted to zero in a real process situation. When chosen, the transmitter will measure the pressure in an actual process. This measurement will be used as the zero value. (4 mA)

1. Navigate to program point **P101**, and push the button to enter the menu.
2. Choose “**use process**”, and push to confirm. The transmitter will display the actual measured value.
3. Push the navigation button to confirm, and select **SAVE** to save the setting.
4. The transmitter will return to the main menu.

The ZERO will automatically be set to 0.000 when enabling the Square Root function. After enabling the Square Root function the ZERO (Program point P101) cannot be configured.

12.2 P102 Span Adjustment (Span, 20 mA)

This setting can be used to adjust the range (SPAN) according to an entered value or adjusted with or without an applied pressure. The maximum pressure which can be measured (20 mA) is the measurement at ZERO (P101) + the entered value SPAN (P102). If the ZERO (P101) is increased then the maximum measured value will automatically be set higher at same rate like the zero.

This will be explained step by step by an example.

Example: Measurement range 100 – 2000 mbar = 4 - 20 mA.

1. Navigate to program point **P102 - SPAN Value**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: **Set manual** and **Use process**
Choose **Set manual**, a value will appear on the screen. (Depending on the range.)
3. Adjust the **SPAN** with the navigation button to 1900 mbar. and select **SAVE** to save the setting
4. The transmitter will return to the home screen.

The menu span adjustment also has the choice of “**use process**”. The transmitter can be adjusted to the span in a real process situation. When chosen, the transmitter will measure the pressure in an actual process. This measurement will be used as the span value. (20 mA)

1. Navigate to program point **P102**, and push the button to enter the menu.
2. Choose “**Use process**”, and push to confirm. The transmitter will display the actual measured value.
3. Push the navigation button to confirm, and select **SAVE** to save the setting.
4. The transmitter will return to the main menu.



P102 is the adjustment of the total span.

When a compound range must be adjusted (for example -1 till +3 bar), a span of 4 bar must be programmed. The Zero (P101) must be set at -1 bar. The transmitter is adjusted at **- 1 bar = 0** and **+4 bar = Span**


12.3 P103 Cancel Mounting Position Effect (4 mA)

All transmitters are vertically calibrated. If the transmitter is installed horizontally, the transmitter has a small "mounting position" effect on the zero (4 mA). The current value displayed, will be for example 4,020 mA instead of 4,000 mA. This effect can be neutralized within this menu.


1. Navigate to program point **P103 – MOUNT corr.**, and push the navigation button to enter the menu.

2. Two choices appear on the screen: “Set” and “Reset”

Choosing **Set** will adjust the zero to 4,000 mA in the mounting position when applicable.

- Select **Set**, and push the button to confirm.
- The Save  icon will be displayed to indicate that the setting is saved.
- The transmitter will return to the main menu.

Choosing **Reset** will put the transmitter back to factory setting. (vertical adjustment 4 mA)

- Select **Reset**, and push the button to confirm, the setting will be put back to factory setting. The Save  icon will be displayed to indicate that the setting is saved.
- The transmitter will return to the main menu.




Do not apply pressure while executing "Cancel mounting position effect"

For low pressure ranges, the mounting effect on the zero point will be more noticeable, therefore it is important to execute P103 after installing the transmitter.

12.4 P104 Display settings of units

Various engineering units can be displayed on the display.

Factory setting = mbar


1. Navigate to program point **P104 – UNIT**, and push the navigation button to enter the menu.
2. Several engineering units can be selected. Each selected engineering unit is automatically converted to the correct value of the corresponding unit.
3. Navigate through this menu and choose the required unit, push to confirm.
4. The Save  icon will be displayed to indicate that the setting is saved.
5. The transmitter will return to the main menu, the measured reading will be displayed in the chosen unit in the home screen.



The selected pressure unit is only visible on the display, if UNITS is chosen in program point P109 – Readout.

12.5 P105 Output selection 4-20 mA or 20-4 mA

The transmitter is standard set to 4-20 mA.

1. Navigate to program point **P105 – Reverse mA**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: **4-20 mA** and **20-4 mA**
3. Make an output choice and push to confirm.
4. The Save  icon will be displayed to indicate that the setting is saved.
5. The transmitter will return to the main menu.


12.6 P106 Adjustment Damping (0 - 25 sec)

The transmitter has an adjustable damping between 0,00 to 25,00 seconds.


Factory setting = 0,00 seconds

1. Navigate to program point **P106 – DAMPING**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: **Set** and **Reset**
3. Make a choice and push to confirm.

Choosing **Set** allows a value to be set between 0,00 and 25,00 seconds.


- Select Set, and push the button to confirm.
- Adjust the damping with the navigation button, push to confirm.
- The Save  icon will be displayed to indicate that the setting is saved.
- The transmitter will return to the main menu.

Choosing **Reset** will put the setting back to factory setting (0,0 seconds)

- Select Reset, and push the button to confirm.
- The Save  icon will be displayed to indicate that the setting is saved, the setting will be put back to factory setting 0,00 s.
- The transmitter will return to the main menu.

12.7 P107 Language

In this menu the preferred menu language can be selected.

1. Navigate to program point **P107 - LANGUAGE**, and push the navigation button to enter the menu.
2. Five choices appear on the screen: **English, Dutch, Spanish, German, Russian, Polish and French.**
3. Make a choice and push to confirm.
4. The Save  icon will be displayed to indicate that the setting is saved.
5. The transmitter will return to the main menu.

12.8 P108 Device Setup

In this menu, several operational settings can be made for the transmitter and the display.

1. Navigate to program point **P108 – Device Setup**, and push the navigation button to enter the menu.
2. The following choices appear on the screen: **Protection - Alarm output - Backlight - Temp units - Temp min/max - Sec. Value - Set Time - HART® Version and POL address** (*Set time, HART® version and POL address are only available when HART® protocol is present in the transmitter*)
3. Choose the desired option, push to confirm.
4. Below are the choices displayed. They can be selected and configured using the navigation button.
 - **Protection:**
 - **Local:** The local protection for adjusting settings locally on the transmitter.
 - **External :**The external security for adjusting settings remotely on the transmitter by HART® protocol.
 - **Alarm output:**
 - **Low:** The lower limit of the lowest permissible current value. (3,2 mA)
 - **High:** The upper limit of the maximum permissible current value (22,8 mA)
When exceeding the above limits, a warning symbol will display on the screen.
 - **Backlight:** Choice between: **On, Sleep mode** (Turn off backlight after 5 minutes) and **Off**. The intensity of the backlight is depending on the output current.
 - **Temp units:** Choice between: **Celsius** and **Fahrenheit**.
 - **Temp min/max:** Two choices appear on the screen: **Readout** and **Reset**
By choosing **Readout** the last measured minimum and maximum temperature values of process and ambient appear. For the process temperature, a new value is stored in a change of temperature more than 2 ° C. For the ambient temperature this is 5 ° C. By choosing **Reset** the previous stored values will be deleted.
 - **Sec. Value:** Four choices appear on the screen for the secondary readout on the main screen: **Current, Unit, Rate and Temperature**.
 - **Set Time:** (*Only available when using HART® 7 Protocol*)
An input screen to enter the date and time will appear.
 - **HART® version:** Choice between: **HART® 5.0** and **HART® 7.0**.
 - **POL address:** (*Only available when using HART® Protocol*)
0 up to 63 can be chosen.


12.9 P109 Readout

In this menu, the readout on the display is determined. This is the type of measurement that appears on the home screen.


Factory Setting = Unit


1. Navigate to program point **P109 – READOUT**, and push the navigation button to enter the menu.
2. Nine choices appear on the screen:
 - Current** = Present current value (4-20mA)
 - Unit** = Pressure unit as chosen in **P104**
 - Percentage** = 0-100%
 - Temperature** = Actual sensor temperature (°C or F) *
 - Hectoliter** = Number of hectoliters (only possible in combination with linearization P111)
 - Cubic meter** = Number of cubic meters (only possible in combination with linearization P111)
 - Liter** = Number of liters (only possible in combination with linearization P111)

Kilogram = Number of kilograms (only possible in combination with linearization P111) After selecting this readout the **Specific Gravity** of the medium (**SG** = g/cm³) must be entered with a value between 0.2 and 4.0 g/cm³.

The specific gravity will appear on the home screen (g/cm³) under the primary chosen readout. This readout will be indicated as a linear measurement, and displayed by the symbol  on the home screen.

Tons = Number of tons (only possible in combination with linearization P111)

After selecting this readout the **Specific Gravity** of the medium (**SG** = g/cm³) must be entered with a value between 0.2 and 4.0 g/cm³. This readout will be indicated as a linear measurement, and displayed by the symbol  on the home screen. The specific gravity will appear on the home screen (g/cm³) under the primary chosen readout.

3. Navigate to the desired choice, confirm the selection by pushing the navigation button. The Save  icon will be displayed to indicate that the setting is saved.
4. The transmitter will return to the main menu.
*(Indication of process temperature, accuracy depending on sensor position)



For measuring weight (Kg and Tons), a reliable accuracy cannot be guaranteed, the PLATINUM SERIES pressure transmitter cannot compensate for Specific Gravity changes or any thermal increase or decrease.

12.10 P110 Simulation of current (4-20 mA)

The transmitter can simulate an output between 4-20 mA.

Using five predefined steps or a free selectable value between 3,80 mA to 20,8 mA (Transmitters with HART® Protocol 3,90 mA to 20,8 mA)

1. Navigate to program point **P110 – CURR SIMU**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: “**Set**” and “**Free**”
3. Choosing **Set** allows a value to be set in five steps: 4, 8, 12, 16, 20 mA
 - By default the current simulation is **Not active**, as shown in the display
 - Choose one of the five steps, and push to confirm
 - The status on the display will change to **Active** and the current simulation is started for the selected step.
 - Push the navigation button to de-activate the current simulation.
 - Move the navigation button to the left to go back and leave this menu.
4. With the option **Free**, a current between 4 and 20 mA can be configured.
 - By default the current simulation is **Not active**, as shown in the display.
 - Enter the desired value, and push to confirm.
 - The status on the display will change to **Active** and the current simulation is started for the selected value.
 - Push the navigation button to de-activate the current simulation.
 - Move the navigation button to the left to go back and leave this menu.

12.11 P111 Linearization

In this menu, various tank linearization's can be selected.

Factory setting = No linearization

For a horizontal tank or a tank with a cone, linearization can be configured. The volume as a measured value will be displayed on the home screen. (Must be set in P104)

The values (configured in the following settings) must be in meters.

Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu. Six choices appear on the screen:

No Lin = No linearization

Hor. Tank = Linearization setting for a horizontal tank: cylindrical and elliptic

Vert. Cone = Linearization setting for a vertical tank with a conical bottom.


Vert. Sphere = Linearization setting for a vertical tank with a spherical bottom.


Vert. Trunc = Linearization setting for a vertical tank with a truncated bottom.


Free lin = Free linearization setting, adjustable in 70 free programmable points.

The following describes the setting for each linearization configuration.

LINEARIZATION DISABLE

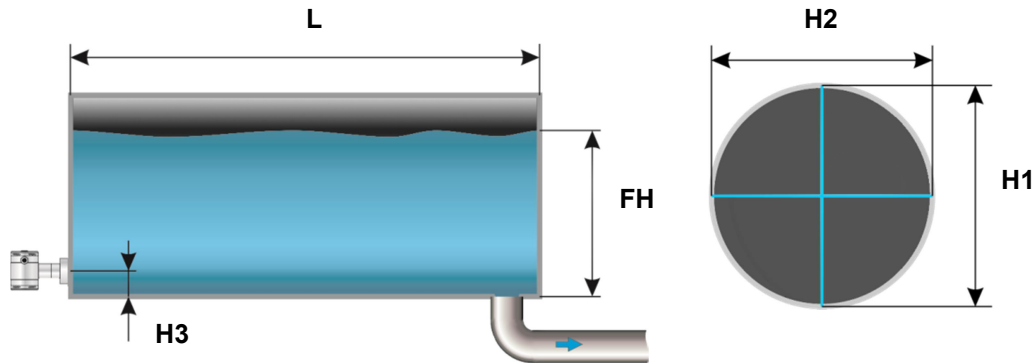
With the choice **No. Lin.** an existing linearization can be turned off and can be identified by the symbol on the home screen: 

Linearization can be recognized by the following symbol on the home screen: 

1. Select **No Lin.** and confirm this with the button.
2. The Save  icon will be displayed to indicate that the setting is saved.

The following pages describe the setting for each type of linearization.

LINEARIZATION HORIZONTAL TANK (WITH FLAT END)



1. Navigate to **Hor. Tank.** with the navigation button, and push to confirm.
2. Two choices appear on the screen: **Input** and **Simulate**
3. Select **Input**, and push to confirm.
4. Six choices appear on the screen:

Display	Drawing	Explanation
Length	L	The length of the tank
Height 1	H1	The height of the tank
Height 2	H2	The diameter of the tank (with a cylindrical tank, this is equal to the height of the tank)
Height 3	H3	The height till the topside of the diaphragm (or weld-on nipple)
Height 4	H4	Value must be 0
Fill Height	FH	The maximum percentage of filling of the tank

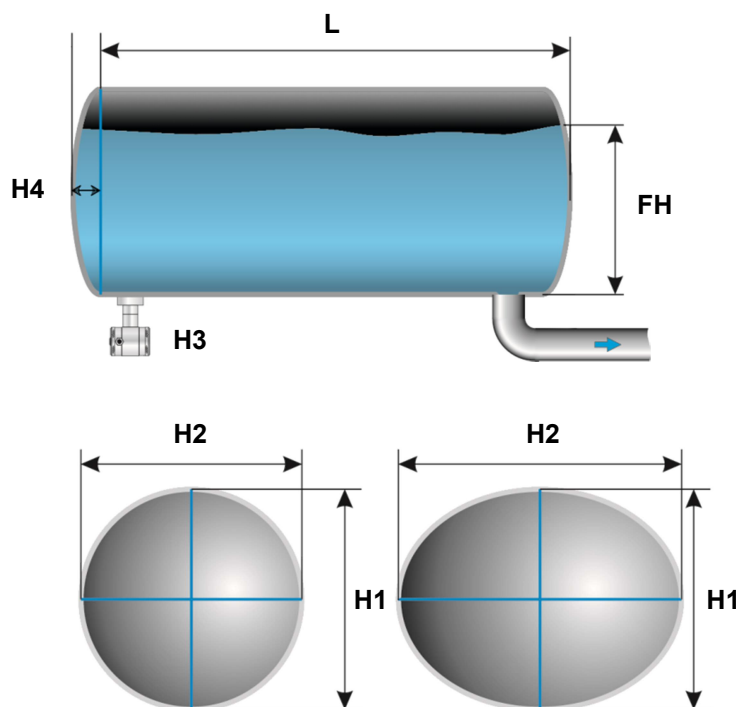
5. Fill in each value except Height 4, and confirm each selection with the control button. The values must be entered in meters.
6. Select **SAVE** to save the setting.
7. The transmitter will return to the main menu.

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation based on the entered value's. Based on the value entered in mWc, the transmitter will display the number of hectoliters (on the basis of the specified linearization values).

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Hor. Tank.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Input** and **Simulate**
4. Select **Simulate**, and push to confirm.
5. Fill in the desired value based on mWc, the number of hectoliters change directly with a change in the value mWc.

LINEARIZATION HORIZONTAL TANK WITH A PARABOLIC END (CYLINDRICAL OR ELLIPTIC)



1. Navigate to **Hor. Tank.** with the navigation button, and push to confirm.
2. Two choices appear on the screen: **Input** and **Simulate**
3. Select **Input**, and push to confirm.
4. Six choices appear on the screen:

Display	Drawing	Explanation
Length	L	The length of the tank
Height 1	H1	The height of the tank
Height 2	H2	The diameter of the tank (with a cylindrical tank, this is equal to the height of the tank)
Height 3	H3	The height till the topside of the diaphragm (or weld-on nipple)
Height 4	H4	The length of 1 parabolic end of the cylinder
Fill Height	FH	The maximum percentage of filling of the tank

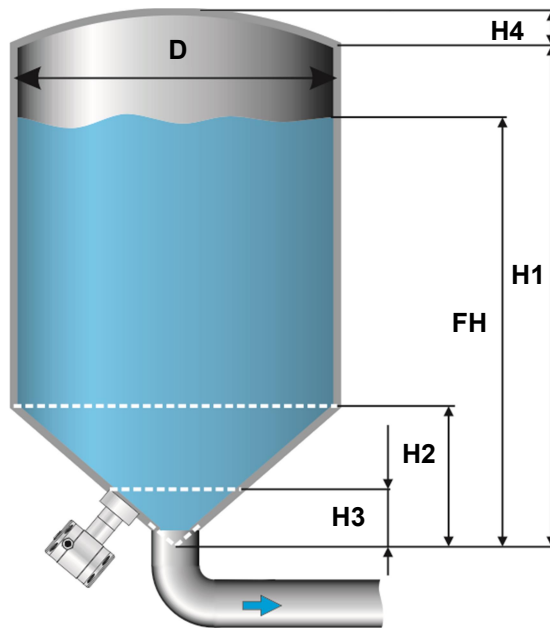
5. Fill in each value, and confirm with the navigation button. **The entered value's must be in meters.**
6. Select **SAVE** to save the setting.
7. The transmitter will return to the main menu.

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation based on the entered value's. Based on the value entered in mWc, the transmitter will display the number of hectoliters (on the basis of the specified linearization values).

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Hor. Tank.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Input** and **Simulate**
4. Select **Simulate**, and push to confirm.
5. Fill in the desired value based on mWc, the number of hectoliters change directly with a change in the value mWc.

LINEARIZATION VERTICAL TANK WITH A CONICAL BOTTOM



1. Navigate to **Vert. Cone**. with the navigation button, and push to confirm.
2. Two choices appear on the screen: **Input** and **Simulate**
3. Select **Input**, and push to confirm.
4. Six choices appear on the screen:

Display	Drawing	Explanation
Height1	H1	The height of the tank
Diameter	D	The diameter of the tank
Height 2	H2	the height of the cone
Height 3	H3	The height till the topside of the diaphragm
Height 4	H4	The height of the parabolic tank roof
Fill Height	FH	The maximum percentage of filling of the tank

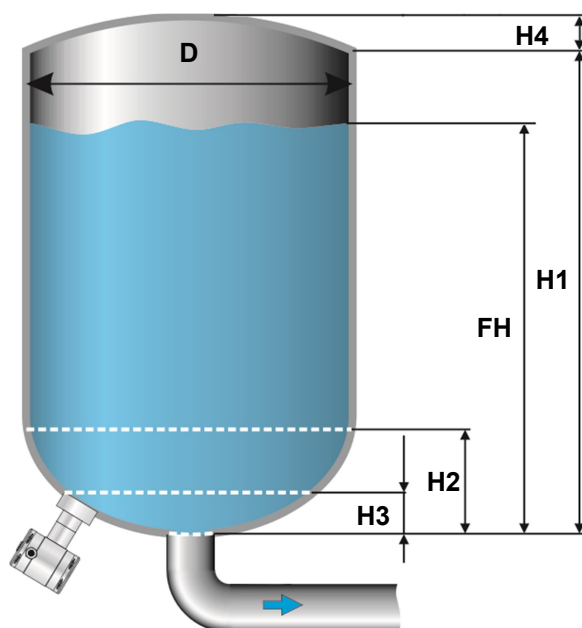
5. Fill in each value, and confirm with the navigation button. **The entered value's must be in meters.**
6. Select **SAVE** to save the setting.
7. The transmitter will return to the main menu.

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation based on the entered value's. Based on the value entered in mWc, the transmitter will display the number of hectoliters (on the basis of the specified linearization values).

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Vert. Cone**. with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Input** and **Simulate**
4. Select **Simulate**, and push to confirm.
5. Fill in the desired value based on mWc, the number of hectoliters change directly with a change in the value mWc.

LINEARIZATION VERTICAL TANK WITH A SPHERICAL BOTTOM



1. Navigate to **Vert. Sphere.** with the navigation button, and push to confirm.
2. Two choices appear on the screen: **Input** and **Simulate**
3. Select **Input**, and push to confirm.
4. Six choices appear on the screen:

Display	Drawing	Explanation
Height1	H1	The height of the tank
Diameter	D	The diameter of the tank
Height 2	H2	the height of the spherical bottom
Height 3	H3	The height till the topside of the diaphragm
Height 4	H4	The height of the parabolic tank roof
Fill Height	FH	The maximum percentage of filling of the tank

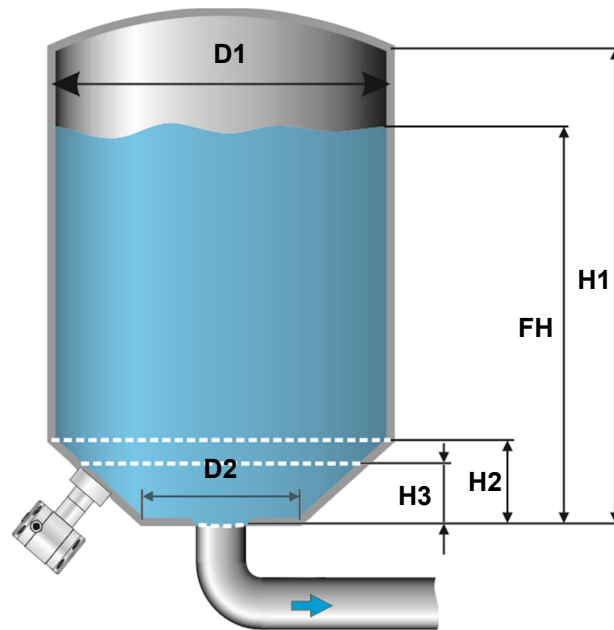
5. Fill in each value, and confirm with the navigation button. **The entered value's must be in meters.**
6. Select **SAVE** to save the setting.
7. The transmitter will return to the main menu.

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation based on the entered value's. Based on the value entered in mWc, the transmitter will display the number of hectoliters (on the basis of the specified linearization values).

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Vert. Sphere.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Input** and **Simulate**
4. Select **Simulate**, and push to confirm.
5. Fill in the desired value based on mWc, the number of hectoliters change directly with a change in the value mWc.

LINEARIZATION VERTICAL TANK WITH A TRUNCATED BOTTOM



1. Navigate to **Vert. Trunc.** with the navigation button, and push to confirm.
2. Two choices appear on the screen: **Input** and **Simulate**
3. Select **Input**, and push to confirm.
4. Six choices appear on the screen:

Display	Drawing	Explanation
Height1	H1	The height of the tank
Diameter 1	D1	The diameter of the tank
Height 2	H2	the height of the cone
Height 3	H3	The height till the topside of the diaphragm
Diameter 2	D2	The diameter of the truncated bottom
Fill Height	FH	The maximum percentage of filling of the tank

5. Fill in each value, and confirm with the navigation button. **The entered value's must be in meters.**
6. Select **SAVE** to save the setting.
7. The transmitter will return to the main menu

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation based on the entered value's. Based on the value entered in mWc, the transmitter will display the number of hectoliters (on the basis of the specified linearization values).

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Vert. Trunc.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Input** and **Simulate**
4. Select **Simulate**, and push to confirm.
5. Fill in the desired value based on mWc, the number of hectoliters change directly with a change in the value mWc.

FREE LINEARIZATION

FREE LINEARIZATION IN PROCESS

1. Navigate to program point **P111 – TANK LIN**, and push to confirm.
2. Navigate to **Free lin.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Measured** and **Manual**
4. Select **Measured** to configure a free linearization in a process situation.

5. Two choices appear on the screen: **Input** and **Simulate**
6. Select **Input**, and push to confirm
7. Five choices appear on the screen:

Clear table: The previous entered values for linearization will be deleted. It is advisable to use this feature for each time a new linearization is configured.



All entered values and dimensions of an existing / previous linearization will be erased

Volume units: Select the preferred unit: Liters, Hectoliters, Kg and Tons (after linearization the unit can be changed and selected in **P109**)

Height: The height of the tank can be filled in (highly recommended for an accurate linearization). The transmitter will determine with this height the span. A linearization will be made with the smallest possible deviation. *Factory setting = Saved span in P102.*

Start Point: The filling of a tank can be measured up to 70 points. The transmitter must be installed in an actual process to accomplish these measurements. The measuring must take place from low to high. (Filling an empty tank). The actual measuring will be displayed on the screen in percentage (%) for **Xn** (filling) and for **Yn** the measured volume. To enter the next measured point move the navigation button up and enter the values.

Save: When all desired measurements are completed and all parameters have been set, the linearization must be saved. Push the navigate button to the left and select **SAVE** to save the linearization. The transmitter will return to the main menu.



WARNING AND PRECAUTIONS

- When a tank filling (**Xn**) does not reach 100 % of the height of the tank, the transmitter will calculate the remaining part. This calculating method is linear and will only be used for the remaining part up to 100 %.



- It is not advisable to manually adjust the SPAN in program point P102 after a linearization has been configured. If the SPAN is adjusted after a linearization configuration, a warning will appear on the screen when entering P102.
- When the a free linearization is used for measuring weight (Kg and Tons), a reliable accuracy cannot be guaranteed due to external influences such as heat and tank wall expansion. **The change of Specific Gravity due to different temperatures cannot be compensated by the PLATINUM SERIES pressure transmitter.**

SIMULATION

After linearization is entered and saved, it is possible to perform a simulation. (Based on the saved linearization) The transmitter will convert the entered mWc to hectoliters.

FREE LINEARIZATION MANUALLY

When it's not possible to enter and measure for a linearization in an actual process condition, a free linearization can be configured manually. Known measurements values and volumes must be entered manually in the transmitter.

1. Navigate to program point **P111 – TANK LIN**, and push the navigation button to enter the menu.
2. Navigate to **Free lin.** with the navigation button, and push to confirm.
3. Two choices appear on the screen: **Measured** and **Manual**
4. Select **Manual** to configure a free linearization manually.
5. Two choices appear on the screen: **Input** and **Simulate**

6. Select **Input**, and push to confirm.
7. Five choices appear on the screen:

Clear table: The previous entered values for linearization will be deleted. It is advisable to use this feature for each time a new linearization is configured.



All entered values and dimensions of an existing / previous linearization will be erased

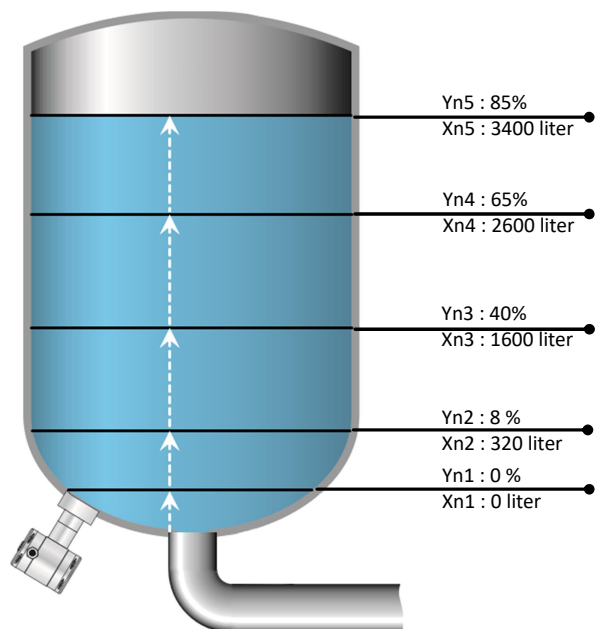
Volume units: Select the preferred unit: Liters, Hectoliters, Kg and Tons (after linearization the unit can be changed and selected in **P109**).

Height: The height of the tank can be filled in (highly recommended for an accurate linearization). The transmitter will determine with this height the span. A linearization will be made with the smallest possible deviation. *Factory setting = Saved span in P102.*

Start Point: The contents of a tank can be configured up to 70 points. The entered value's must be from low to high (Filling an empty tank). The manually entered values will be displayed on the screen in percentage (%) for **Xn** and for **Yn** in Hectoliters. To enter the next measured point move the navigation button up and enter the values.

Example: A tank filling must programmed in the transmitter.

- Choose **Clear Table** to remove all possible previous settings.
- Choose the preferred **Volume units**.
- Fill in the **Height** of the tank (highly recommended for an accurate linearization).
- In menu **Start Point** the linearization points can be filled in. In **Xn1** the percentage of the filling must be filled in. In **Yn1** the corresponding volume. After this, there are 69 more linearization points available.
- When all (needed) points are filled in, the linearization must be saved. Push the navigation button to the left and select **SAVE** to save this linearization.



The figure above shows a tank with standard dimensions. Free linearization can be applied on a wide variety of tanks with non-standard dimensions.

Save: When all desired measurements are completed and all parameters have been set, the linearization must be saved. Push the navigation button to the left to Exit and select **SAVE** to save the linearization. The transmitter will return to the main menu.



WARNING AND PRECAUTIONS

- When a tank filling (**Xn**) is not configured till 100 %, the transmitter will calculate the remaining part. This calculating method is linear and will only be used for the remaining part up to 100 %.



- It is not advisable to manually adjust the SPAN in program point P102 after a linearization has been configured. If the SPAN is adjusted after a linearization configuration, a warning will appear on the screen when entering P102.
- When the a free linearization is used for measuring weight (Kg and Tons), a reliable accuracy cannot be guaranteed due to external influences such as heat and tank wall expansion. **The change of Specific Gravity due to different temperatures cannot be compensated by the PLATINUM SERIES pressure transmitter.**

SIMULATION

After linearization is entered and stored, it is possible to perform a simulation. (Based on the stored linearization) The transmitter will convert the entered mWc to hectoliters.



The PLATINUM SERIES can be delivered with a special setting of the software, enabling the display to show a reading in weight.

12.12 P112 Burst mode

The transmitter (Only when HART® is present) can be configured for Burst mode. This will enable continuously broadcasting standard HART® reply messages.

1. Navigate to program point **P115 – Burst Mode** and push the navigation button to enter the menu.
2. A message appear on the screen, push to enter this menu.
3. Three choices appear on the screen: “0”, “1” and “2”
4. With these choices, three distinct types of burst messages can be configured. Make a choice, and push the button to confirm.
5. Four choices appear on the screen: **Mode Cntrl**, **Cmd number**, **Period** and **Trigger** With these choices the chosen burst message (0,1 and 2) can be configured. Select **Mode Cntrl**, and push to confirm.
6. Two choices appear on the screen: “On” and “Off”
 - Choose **On** to turn on burst mode.
 - Choose **Off** to turn off burst mode.
7. Select **Cmd number**, and push to confirm.
Five choices appear on the screen:
 - **Cmd 01** = PRIMARY VARIABLE
 - **Cmd 02** = CURRENT AND PERCENT OF RANGE
 - **Cmd 03** = DYNAMIC VARIABLES AND CURRENT
 - **Cmd 09** = DEVICE VARIABLES WITH STATUS
 - **Cmd 48** = ADDITIONAL TRANSMITTER STATUS
 Choose the preferable burst mode, and push to confirm.
8. Select **Period**, and push to confirm.
Two choices appear on the screen: “**Max Time**” and “**Min Time**”
 - Select **Max Time** to set the maximum amount of time when the message will be send. This value can be set from 0.5 to 3600 seconds.
 - Select **Min Time** to set the minimum amount of time when the message will be send. This value can be set from 0.5 to 3600 seconds.
 Enter the preferred value, and push to confirm.
9. Select **Trigger**, and push to confirm.
10. Five choices appear on the screen:

Continuous	=	The Burst message is send continuously.
Windowed	=	The Burst message is triggered when the measured value deviates more than the specified trigger value.
Rising	=	The Burst message is triggered when the measured value rises above the triggered value.
Falling	=	The Burst message is triggered when the measured value falls below the triggered value.
On-Change	=	The Burst message is triggered when any value in the measuring changing.

Choose the desired burst mode, and set the preferred parameters.

12.13 P113 Information

This menu shows a collection of information from the transmitter and contact information from the manufacturer.

1. Navigate to program point **P113 - Information** and push the navigation button to enter the menu.
2. Push the navigation button up and down to see all of the information
3. Push the button to leave this menu.

Below is a representation of this information screen:

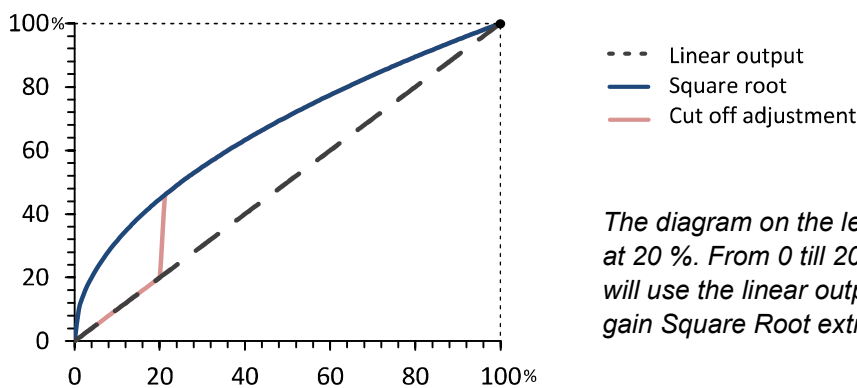
```

Ashcroft Instruments GmbH
www.ashcroft.eu
0049(0) 2401-808-0
Version          -      Software revision
No:              -      Serial number transmitter
Zero             -      Zero (Bar)
Span             -      Span (Bar)
Damping          -      Damping (in seconds)
Output           -      Output 4-20 or 20-4 mA
Local Prot      -      Protection On or Off
Alarm           -      Alarm output (3.2 or 22.8 mA)
Sec. Value      -      Selected secondary configuration
Backlight       -      Backlight On, Sleep mode or Off
Temp            -      Temperature unit Celsius or Fahrenheit
HART® version   -      HART® version 5 or 7 (when HART® is present)
    
```

12.14 P114 Square Root

In this menu the characteristics of a flow, volume and differential pressure measuring can be configured. The following options are available:

1. Navigate to program point **P114 – Square root**, and push the navigation button to enter the menu.
2. Five choices appear on the screen:
 - **Function**
 - **Linear:** The differential pressure measuring between 0 and 100 % of the span.
 - **Square root:** Flow and Volume measuring
The Zero (**Program point P101**) will automatically be set to 0.000 when enabling the Square Root function. After enabling the Square Root function the **Zero (Program point P101)** cannot be configured.
 - **Cut off:** The Square root function can be enabled with an adjustable cut off value between 0 and 20%. The cut off adjustment prevents high gain on low values from the Square Root extraction.



The diagram on the left shows a cut off adjustment at 20 %. From 0 till 20 % the Square root output will use the linear output value instead of the high gain Square Root extraction.

- **Square Root unit:** Multiple engineering units can be selected. Each selected unit is automatically converted to the correct value of the corresponding unit. The following units can be selected:

Volumetric Flow units


Unit	Description
ft ³ /m	Cubic feet per minute
gal/m	Gallons per minute
l/m	Liters per minute
iGal/m	Imperial gallons per minute

m ³ /h	Cubic meter per hour
gal/s	Gallons per second
Mgal/d	Million gallons per day
l/s	Liters per second
MI/d	Million liters per day
ft ³ /s	Cubic feet per second
ft ³ /d	Cubic feet per day
m ³ /s	Cubic meters per second
m ³ /d	Cubic meters per day
iGal/h	Imperial gallons per hour
iGal/d	Imperial gallons per day
m ³ /h	Normal cubic meter per hour (MKS System)
l/h	Normal liter per hour (MKS System)
ft ³ /m	Standard cubic feet per minute
ft ³ /h	Cubic feet per hour
m ³ /m	Cubic meters per minute
bbbl/s	Barrels per second (1 barrel equals 42 U.S. gallons)
bbbl/m	Barrels per minute (1 barrel equals 42 U.S. gallons)
bbbl/h	Barrels per hour (1 barrel equals 42 U.S. gallons)
bbbl/d	Barrels per day (1 barrel equals 42 U.S. gallons)
gal/h	Gallons per hour
iGal/s	Imperial gallons per second
l/h	Liters per hour
gal/d	Gallons per day


Mass Flow units


Unit	Description
g/s	Grams per second
g/m	Grams per minute
g/h	Grams per hour
kg/s	Kilograms per second
kg/m	Kilograms per minute
kg/h	Kilograms per hour
kg/d	Kilograms per day
T/m	Metric tons per minute
T/h	Metric tons per hour
T/d	Metric tons per day
lb/s	Pounds per second
lb/m	Pounds per minute
lb/h	Pounds per hour
lb/d	Pounds per day
sT/m	Short tons per minute
sT/h	Short tons per hour
sT/d	Short tons per day
lT/h	Long tons per hour
lT/d	Long tons per day

To display the Square Root output on the display, navigate to program point **P109 - READOUT**, and push to confirm. Navigate to **Square Root** and push to confirm.

The readout on the display will now show the Square Root output, and displayed by the symbol  on the home screen.

The scale of the readout can be adjusted between ≥ 0 and 100 % by adjusting the scaling in the Lower and Upper range values.

- **Unit LRV:** The Lower Range Value can be adjusted between ≥ 0 and 100. This is the value (flowrate) you want to see on the display when the signal is 4 mA, so basically there is no flow. Value is mostly set at 0. Push the navigation button to enter the menu. A value can be entered. Push to confirm. The Save  icon will be displayed to indicate that the setting is saved.

- Unit URV:** The Upper Range Value can be programmed between 0 and 100. This value should always be 10% higher than the Lower Range Value. This is the flowrate that you want to see on the display when the signal is 20 mA. Push the navigation button to enter the menu. A value can be entered. Push to confirm. The Save  icon will be displayed to indicate that the setting is saved.


12.15 P115 Factory

Only available for the manufacturer

12.16 P116 Factory

Only available for the manufacturer

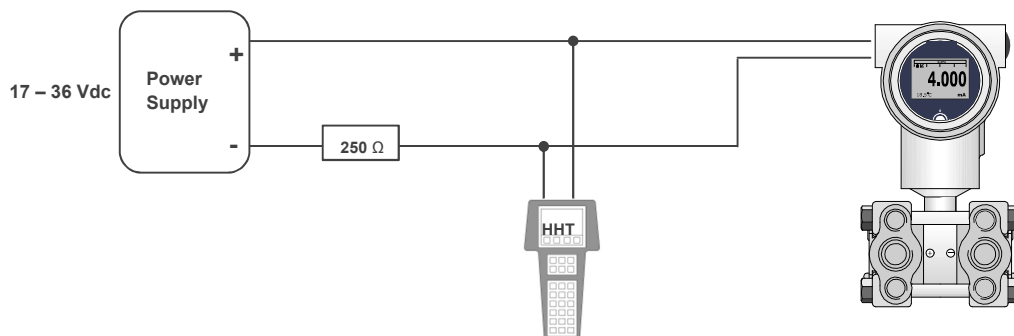
13 Programming the PLATINUM SERIES DP55

 When using HART® or a Hand Held Terminal (HHT), a minimum resistance of 250 ohms **must** be present in the loop of the 2-wire system. This is necessary for proper communication (see drawing below). A power supply of at least **17 Vdc** must be used.

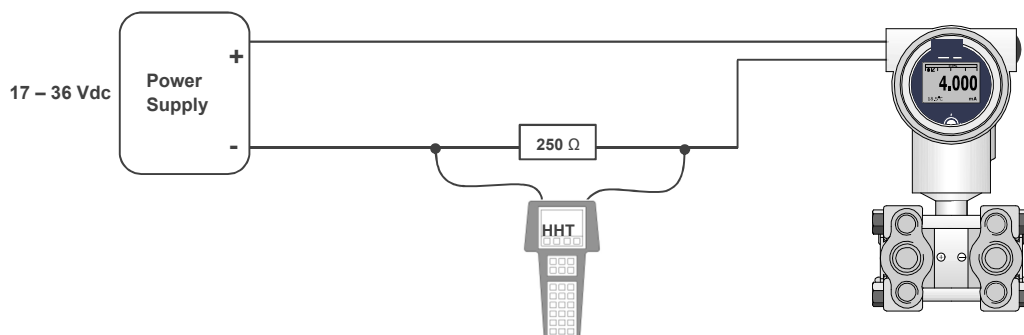
13.1 Programming with the hand held terminal

The PLATINUM SERIES DP55 can be easily programmed with the Hand Held Terminal (HHT) from the "HART Foundation" (type 275 or 375 Hart Communicator).

Option 1: HART® Handheld terminal connected across the transmitter.



Option 2: HART® Handheld terminal connected across the loop resistor.



14 Servicing

The device is maintenance-free. However, to ensure reliable operation and a long lifetime for the device, we recommend that it is checked regularly.

14.1 Safety

When undertaking servicing work on the device, the pressure lines must be depressurized, the electrical connections isolated from the mains supply, and the plant secured against being switched on again.

14.2 Check on function, and recalibration

The check on function and recalibration is carried out at regular intervals, depending on the application. The precise testing cycles should be adjusted in line with the operating conditions and ambient conditions. In the event of various device components interacting, the operating instructions for all other devices should also be taken into account.

- Check on display.
- Check on function, in conjunction with downstream components.
- Check of pressurized connection pipes for seal condition.
- Check of electrical connections.

14.3 Cleaning and maintenance

Cleaning is carried out using a non-aggressive cleaning agent, with the ventilation valve closed and respecting the protection category of the device.

15 Faults

15.1 Safety

Defective or faulty pressure transmitters put the operational safety and process safety of the plant at risk, and can lead to a risk or injury to persons, the environment or the plant.

15.2 Conduct in the event of faults

All defective or faulty devices must be taken out of service. If a repair is required, the device must be sent directly to our Repairs Department. We request that all returns of devices are agreed with our Service Department.

15.3 Fault table

Possible situations indicating a fault:

- No output signal
- Wrong output signal
- Cracked parts
- Indications that the measurement system seal is damaged (process media within the transducer)
- Damage to housing
- Humidity inside the transmitter (wrong sealing of termination)

In these instances, replacement of the pressure transmitter is always required.

15.4 Conduct following fault rectification

See Section 9 Mounting and Installation.

16 Removal, disposal

16.1 Safety



Residues of measuring media in and on removed transmitters can constitute a risk to people, the environment and equipment. Adequate precautionary measures must be adopted. If necessary, the devices must be cleaned thoroughly (see advice in safety data sheets).

16.2 Removal

- When undertaking servicing work on the device, the pressure lines must be depressurized, the electrical connections isolated from the mains supply, and the plant secured against being switched on again.
- Demount the transmitter using a suitable tool

16.3 Disposal



Please help to protect the environment and dispose of or recycle the devices and components used in accordance with the applicable regulations.

17 Appendix

17.1 Data sheet for PLATINUM SERIES DP55

Detailed data sheet is available from supplier's website (see Section 1.7 Manufacturer's address, customer services)

This Table refers to specific documents:

Model	Description	Document
DP55	Stainless steel differential pressure transmitter PLATINUM SERIES	G5.DP55 EN

17.2 Declaration of conformity model DP55