

Installation and Maintenance Instruction Manual

SILVER SERIES TRANSMITTERS



In the following configuration:

- PS55 Process pressure and level transmitter SILVER SERIES
- CS55 Cleanline pressure and level transmitter SILVER SERIES



PS55



CS55

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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 16) 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 SILVER SERIES PS55 or CS55 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 SILVER SERIES PS55 or CS55 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
- WELDING INFORMATION: When using the SILVER SERIES with weld on nipple, the welding information in Section 8 must be followed exactly. This is very important to prevent distortion of the weld-on nipples. It also prevents the screw thread from the Cleanline transmitter CS55 (M56 x 1.25) from being deformed.
- 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.
- Configuring the transmitter local and remote simultaneously will cause transmission errors and must be prevented.
- 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.

- Avoid high pressure water-jets pointed at the venting.
- If the ambient conditions are very wet, we advise to use a venting through the cable. A special vented cable can be delivered on request. (The normal venting will be removed). In that case the transmitter is IP68.
- The covers must be fully engaged, so that moisture cannot ingress into the electronic housing.

1.7 Manufacturer's address, customer services

Ashcroft Instruments GmbH	Tel.: +49 (0) 2401/808-888
Max-Planck-Strasse 1	Fax.: +49 (0) 2401/808-999
D-52499 Baesweiler. Germany	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 SILVER SERIES transmitters are solid-state pressure- and level 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 applied. The transmitter electronics detects this change in bridge resistance and converts it into a measuring value. The amplifier system is based on a single Integrated Circuit, which ensures a perfect linearity in the output, all within an accuracy of 0.2 %.

The devices are used for pressure measurements in process or sanitary applications. For each use scenario, the corresponding set-up regulations must be respected.

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 15: 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/ other details

3.1 CE / EMC – Rules

All SILVER SERIES 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 2014/30/EU 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 three numbers from the serial number that is engraved in the transmitter and add 1100 to it.

For example: if the serial number is 91602123. The year of manufacturing is 1100 + 916 = 2016.

4 Technical data

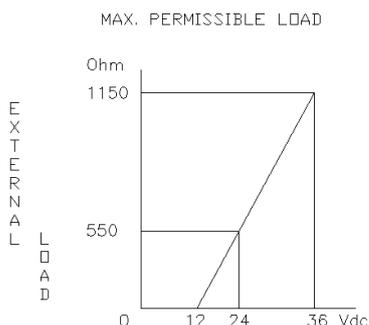
4.1 Specifications

Manufacturer	Ashcroft Instruments GmbH			
Instrument	SILVER SERIES PS55/CS55			
Output	4-20 mA Optional: HART® Protocol			
Power Supply	Standard : 12 – 36 Vdc HART® : 17 – 36 Vdc (Standard) min. 250 Ω			
Accuracy	0,2 % - (Turn down 4:1) (Option: 0,1 %)			
Ranges ¹	Code	Adjustable span ranges		Max. overpressure
SILVER SERIES transmitters PS55/CS55	P1BR	0-0,04 bar	0 - 0,1 bar	3 bar
	P4BR	0-0,1 bar	0 - 0,4 bar	6,4 bar
	1P6BR	0-0,4 bar	0 - 1,6 bar	10,5 bar
	4BR	0-1,0 bar	0 - 4,0 bar	16 bar
	10BR	0-2,0 bar	0 - 10 bar	30 bar
	24BR	0-6,0 bar	0 - 24 bar	100 bar
	80BR	0-20 bar	0 - 80 bar ²	200 bar
Process Temperature	PS55 CS55 ³	-20 °C to +80 °C (-4 °F to 176 °F) -20 °C to +100 °C (-4 °F to 212 °F) 145 °C / 45 min		
Ambient Temperature	-20°C to 70°C (-4 °F to 158 °F)			

Damping	0,0 sec. till 25 sec. Standard damping: 0,0 sec.
Protection grade	IP66
Material	Housing: AISI 304 (Optional AISI 316) "wetted" parts: AISI 316 L (Other materials on request)

1. For vacuum applications and compound ranges in combination with higher process temperatures a special oil filling must be applied. Contact Ashcroft Instruments for information.
2. For pressures higher than 80 bar, Contact Ashcroft Instruments for information.
3. For higher temperatures use other kind of pressure transmitters. Contact Ashcroft Instruments for information.

4.2 External Load



The maximum permissible load (Ri max.) in case of 24 Vdc is 550 Ω (Ohm).

By increasing the power supply, the external load can be increased to 1150 Ohm / 36 Vdc. (see figure left).

$$Ri \text{ max.} = \frac{\text{Power Supply} - 13 \text{ Vdc}(\text{min. power supply})}{20 \text{ mA}}$$



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.

PRESSURE TRANSMITTER:	
Supply: 12 - 36 V dc	Output: 4 - 20 mA
Span: min. 0 -	max. 0 -
Cal.:	Serial no.:
Ashcroft Instruments GmbH Max-Planck-Str. 1 D 52499 Baesweiler Tel: 0049 (0) 2401-808-0	
CE	

6 Construction and function

The SILVER SERIES transmitters are solid-state pressure- and level transmitters based upon a piezoresistive silicon sensor, with a very high burst pressure. The sensor element is mounted in a stainless steel foot. Inside the foot also a temperature sensor is mounted to ensure the process temperature. This temperature sensor is used to create an active temperature compensation. A strong stainless steel flush diaphragm protects the sensor from the process medium. A very small amount of special oil fills the chamber surrounding the sensor and transfers pressure from the flush mounted diaphragm to the sensor.

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 applied. The transmitter electronics detects this change in bridge resistance and converts it into a measuring value. The amplifier system is based on a single Integrated Circuit, which ensures a perfect linearity in the output, all within an accuracy of 0.2 %.

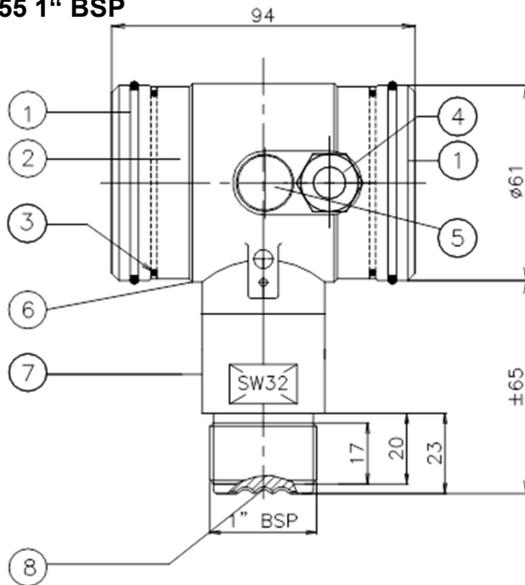
Due to the flush diaphragm technology the long term stability is perfect.

6.1 Process transmitter SILVER SERIES PS55

The SILVER SERIES PS55 are specially designed for the pulp- and paper or similar industries, where clogging is a problem. The very compact construction of the SILVER SERIES PS55 permits flush installation with the tank- or pipe wall. Standard the wetted parts are made of St.St. 316, a lot of other materials like Hastelloy C and gold plated are available as an option.

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.

PS55 1" BSP

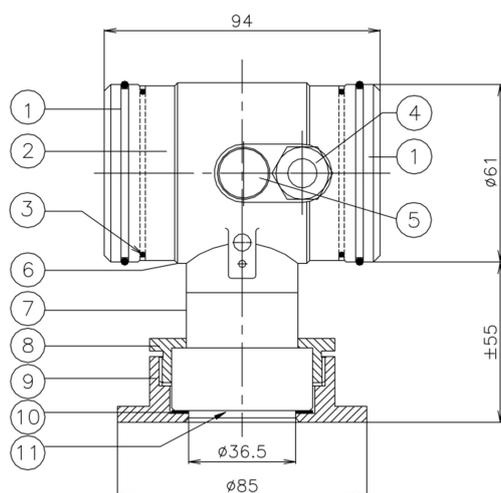


Front view: Digital local indication with transparent cover, option: DG (extra price)

Description	Material	Description	Material
① Cover	St.St. 304	⑤ Venting	PA
② Display with push buttons		⑥ Electronics housing	St.St. 304
③ O-Ring	EPDM	⑦ Foot	St.St. 316
④ PG-9 Cable Gland		⑧ Diaphragm	St.St. 316 L

6.2 Cleanline transmitter SILVER SERIES CS55

The SILVER SERIES CS55 are specially designed with a flush mounted diaphragm so they fully meet the needs of the food, pharma and chemical industries. Standard the wetted parts are made of St.St. 316 L, other materials are available, like Hastelloy C. Various process connections can be delivered, such as Tri-Clamp (1,5", 2" and 3"), SMS (1,5" and 2"), dairy milk couplings (DN 25, 40 and 50), flanges (DIN and ANSI) and sanitary weld-on nipples (ø 48, 62 and 85 mm.)



Front view: Digital local indication with transparent cover, option: DG (extra price)

Description	Material	Description	Material
① Cover	St.St. 304	⑦ Foot	St.St. 316
② Display with push buttons		⑧ Lock Ring	St.St. 304
③ O-Ring	EPDM	⑨ Weld-on nipple	St.St. 316 L
④ PG-9 Cable Gland		⑩ Gasket	PTFE
⑤ Venting	PA	⑪ Diaphragm	St.St. 316 L
⑥ Electronics housing	St.St. 304		

6.3 Barometric reference

The CS55 is in basic a so-called "relative transmitter" which means that barometric changes will not affect the zero. The venting is placed in the cover of the electronics housing next to the cable entry and is the filter for the barometric reference to atmospheric pressure. The venting must be kept clean.

6.4 Accessories

Please contact the manufacturer regarding special tools and accessories.

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, protected against direct exposure to sunlight and protected against impact damage.

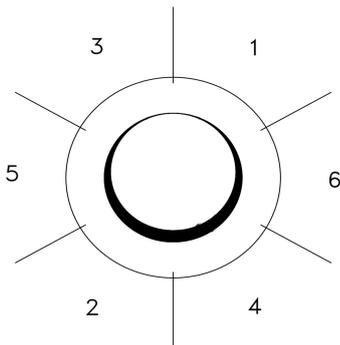
8 Assembly/Installation

The diaphragm of the transmitter is protected with a special protection cap. Protect the diaphragm until installation takes place. * DO NOT DAMAGE THE DIAPHRAGM. *

8.1 Installing Weld-On Nipple

A certified welder should perform installation of the weld-on nipple. Weld with Argon, MIG or TIG. The smallest welding pin should be used.

1. Cut a hole in the process vessel/pipe to accept the weld-on nipple. The hole should produce a tight fit when coupled with the weld-on nipple.
2. Prepare the hole by bevelling the edge to accept filler material.
3. Remove the weld-on nipple from the transmitter.
4. Remove the PTFE packing of the Cleanline transmitter SILVER SERIES CS55
5. **Remove the gasket and O-ring out of the weld-on nipple!**



Improper installation may result in distortion of the weld-on nipple. Excessive heat will distort the weld-on nipple. Weld in sections as shown in the figure left. Allow adequate cooling between passes. **To reduce the chances of distortion to the weld-on nipple, use a mandrel.**

PS55 Part.no. 1016

CS55 Part.no. 1019

Lockring Part.no. 1160

Determine (before welding) the position of the electronic housing, so that the cable entry and the venting are in the right position. After welding these positions are fixed.

6. Position the weld-on nipple in the vessel hole and tack six places. The weld sequence is shown in the figure above.
7. Weld the weld-on nipple in place using 0,03 to 0,045 in. (0,762 to 1,143 mm) stainless rod as filler material in the beveled area. Adjust amperage for penetration.
8. Remove the mandrel after the welding operation.

8.2 Installing Process Transmitter SILVER SERIES PS55 (with weld-on nipple)

1. After welding, clean up edges, and take care of the inside nipple wall.
2. Make sure the O-rings (10) is properly located. Improper installation at the O-ring can cause a process leak.
3. Apply silicone grease to the O-ring(10), diaphragm ring and the hole inside wall of the weld-on nipple, this prevents galvanic cell corrosion between transmitter and nipple inside.
4. Install the transmitter and fix it with the St.St. M8 bolt.

8.3 Installing Cleanline Transmitter SILVER SERIES CS55 (with weld-on nipple)

1. Make sure to correctly locate the packing within the weld-on nipple.
2. Improper installation of the packing can cause a process leak.
3. Position the transmitter into the weld-on nipple and begin engaging threads.
The transmitter can be rotated prior to seating enabling the user to optimize access to calibration adjustments, cable entry, and local indicator.
4. Once the Lock ring has been hand tightened, it must be tightened with an additional turn with adjustable pliers ($\pm 1/8''$).

8.4 Mounting Position

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

8.5 Mounting Position Effect

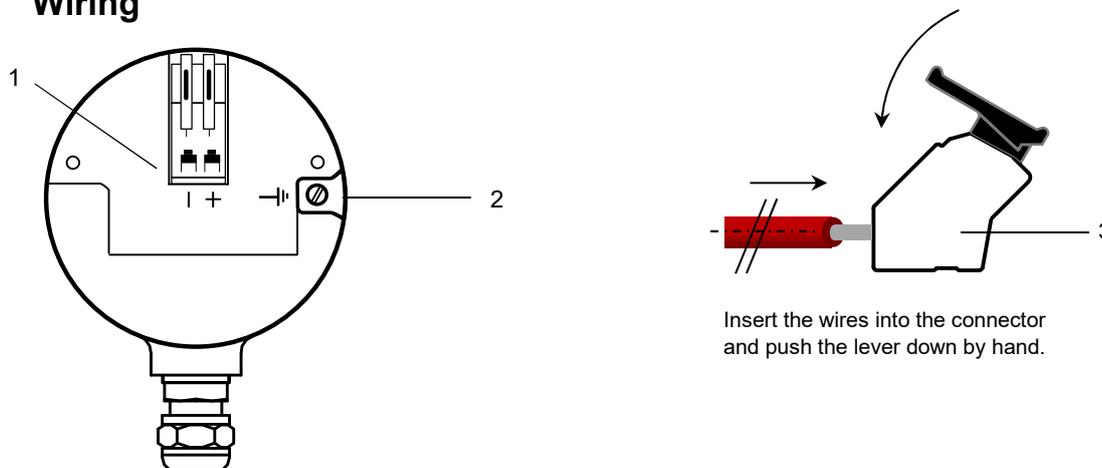
All transmitters are calibrated in vertical position (diaphragm points downwards). If the transmitter is mounted in another position, there can be a little zero shift. (example 4,02 mA instead of 4,00 mA). After installation of the

transmitter the zero must be set to 4,00 mA with P103 (cancel mounting position effect see Section 12.3). This will not affect the span.

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



- 1 Voltage Supply / Output Signal (4 - 20 mA)
- 2 Internal Ground
- 3 Terminal Connector

The figure above shows the wiring connection of the transmitter. The 2-wires must be connected to the terminal board. The wiring terminals can be operated without a screwdriver. The opening levers of the terminal 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.

The transmitter must always be connected to ground. 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 controller or heavy pumps). Shielding must always be connected at the side of the power supply. In case the process connection is already connected to ground (e.g. via the 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'. In applications with synthetic process connections, the enclosure (internal or external) must be connected to ground.

Reversing the polarity will not damage the transmitter, but the transmitter will not function until the + and – are properly connected



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

8.8 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 startup screen with the software version and the pressure range appears for a few seconds. After the startup screen the transmitter will automatically continue to the main screen with the actual measurement reading.

10 Functions of Push Buttons

The SILVER SERIES transmitter has a high contrast display for optimal readout. The menu is controlled by 3 pushbuttons. Navigate with the up and down through menus and measuring values. Enter a menu and confirm selections with the menu button.



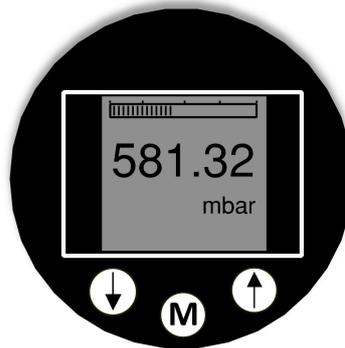
Push the *up* button to browse through various menus and adjusting values.



Push the *down* button to browse through various menus and adjusting values.



Push the *menu* button to enter menus or confirm a selection.



11 Programming points(P100-P110)

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
P104	UNITS	Selection of engineering units
P105	REVERSE mA	Output selection: 4-20 mA or 20-4 mA
P106	DAMPING	Adjustable damping: 0,00 till 25,00 seconds
P107	TEMP UNITS	Temperature unit selection: Celsius or Fahrenheit
P108	DEVICE SETUP	Configuration: Protection, HART, Display mode, Display update
P109	READOUT	Readout options on display: Current, Unit, percentage and temperature
P110	BURST MODE	Continuously broadcast a standard HART reply message

12 Explanation of Programming points P101 to P114

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**.
2. Navigate to program point **P101**, and push the menu button to enter the menu.
3. The actual measured value appear on the display.
4. Increase this value with the arrow button to 100 mBar, and push the button until save appear on the display.

- 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 transmitter can be adjusted to zero in a real process situation. The transmitter will measure the pressure in an actual process. This measurement will be used as the zero value (4 mA).

- Go to the home screen, the transmitter will display the actual measured value.
- Push the  button until the actual measured zero and the message **ZERO PUSHED** appear on the display.
- The transmitter will return to home screen.

12.2 P102 Span Adjustment

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: The measurement at **ZERO (P101)** + the entered value **SPAN (P102)**. If the **ZERO (P101)** is increased, the maximum measured value will automatically be set higher at same rate as the zero. This will be explained step by step by an example.

Example: Measurement range 0 – 2000 mbar.

- The **span** must be set at 2000 mbar
- Navigate to program point **P102**, and push the menu button to enter the menu.
- Adjust the **SPAN** with the push buttons to 2000 mbar and push the  button until save appear on the display.
- The transmitter will return to the home screen.

The span can also be adjusted to a real process situation. The transmitter will measure the pressure in an actual process. This measurement will be used as the span value (20 mA).

- Go to the home screen, the transmitter will display the actual measured value.
- Push the  button until the actual measured span and the message **SPAN PUSHED** appear on the display.
- The transmitter will return to home screen.



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 = Zero** and **+3 bar = Span**.

If the process temperature at -1 bar is above 20 °C **another filling oil** must be applied inside the transmitter.

If the process temperature at -0,5 bar is above 60 °C **another filling oil** must be applied inside the transmitter.

12.3 P103 Cancel Mounting Position Effect

All transmitters are calibrated vertically. If the transmitter is installed horizontally, the transmitter has a small "mounting position" effect on the zero. The pressure value displayed, will be for example 0,002 mbar instead of 0,000 mbar.

- Navigate to program point **P103**, and push the menu button to enter the menu.
- Two choices appear on the screen: **Set** and **Reset**.

Choosing **Set** will adjust the zero to 0,000 mbar in the mounting position when applicable.

- Select Set, and push the menu button to confirm.
- The corrected is value is shown on the display.
- Push the menu button to save.

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

- Select Reset, and push the menu button to confirm to reset back to factory setting.
- The transmitter will return to the home screen.



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

12.4 P104 Display setting of units

Various engineering units can be displayed on the display.

Factory setting = mbar

- Navigate to program point **P104**, and push the menu button to enter the menu.
- Several engineering units can be selected. Each selected engineering unit is automatically converted to the correct value of the corresponding unit.
- Navigate through this menu and choose the required unit, push the menu button confirm.
- The transmitter will return to the home screen. The measured reading will be displayed in the selected unit in the home screen.



The selected pressure unit is only visible on the display when UNITS is chosen in program point P109.

12.5 P105 Output Selection

Factory setting = 4 - 20 mA

1. Navigate to program point **P105**, and push the menu button to enter the menu.
2. Two choices appear on the screen: **4-20** and **20-4**
3. Make an output choice and push the menu button to confirm.
4. The transmitter will return to the home screen.

12.6 P106 Damping Adjustment

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

Factory setting = 0,00 seconds

1. Navigate to program point **P106**, and push the menu button to enter the menu.
2. Two choices appear on the screen: **Set** and **Reset**

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

- Select **Set**, and push the menu button to confirm.
- Adjust the damping with the push buttons and push the menu button to confirm.
- The transmitter will return to the home screen.

Choosing **Reset** will put the transmitter back to factory setting (0,00 seconds)

- Select **Reset**, and push the menu button to confirm to reset back to factory setting.
- The transmitter will return to the home screen.

12.7 P107 Temperature Units

In this menu the preferred temperature unit can be selected.

1. Navigate to program point **P107**, and push the menu button to enter the menu.
2. Two choices appear on the screen: **Celsius** and **Fahrenheit**.
3. Make a choice and push the menu button to confirm.
4. The transmitter will return to the home screen.

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**, and push the menu button to enter the menu.
2. Five choices appear on the screen:

LocProtect : The transmitter can be protected against local adjustments

ComProtect : The transmitter can be protected against adjustments with HART.

HART : Option for HART® 5 and HART® 7 communication.

DispMode : Option for turning the display **on** or **off**.

Disp.Upd.: Option to adjust the refresh rate of the measuring value on the display between 0,0 to 5,0 seconds. For example when this value is set to 2,0 seconds, the measuring value on the display will be refreshed every 2 seconds.

- Select **Set**, and push the menu button to confirm.
- Adjust the setting with the push buttons and confirm with the menu button.
- The transmitter will return to the home screen.
- Choosing **Reset** will put the transmitter back to factory setting (0,0 seconds).

12.9 P109 Read out

In this menu, the type of readout on the display can be adjusted.

Factory Setting = Unit

1. Navigate to program point **P109**, and push the menu button to enter the menu.
2. Four choices appear on the screen:

Current : Current value (4 - 20 mA)

Unit : Pressure unit (Selected in **P104**)

Percentage : 0 - 100 %

Temperature : Actual process temperature (°C or °F) *Indication , accuracy depending on sensor position.*

3. Navigate to the desired choice, confirm by pushing the menu button.
4. The transmitter will return to the home screen.

12.10 P110 Burst mode (HART®)

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 **P110**, and push the menu button to enter the menu.
2. Five choices appear on the screen: **Mode Cntrl**, **Cmd number**, **Message**, **Period** and **Trigger**
3. Select **Mode Cntrl**, and push to confirm.
4. Two choices appear on the screen: **On** and **Off**
 - Choose **On** to turn on burst mode.
 - Choose **Off** to turn off burst mode.
5. Select **Message** to select the burst message 0,1,2 or 3 and push the menu button to confirm.
6. Select **Cmd number**, and push the menu button 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 menu button to confirm.

7. Select **Period**, and push the menu button 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 the menu button to confirm.

8. Select **Trigger**, and push the menu button to confirm.

9. 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.

12.11 P111 Information

This menu summarizes information about the configuration of the transmitter.

Below the contents of the information screen.

<i>V No:</i>	<i>Software Version number</i>	<i>Tunit:</i>	<i>Temperature unit (°C or F)</i>
<i>No:</i>	<i>Serial number of the transmitter</i>	<i>Tph:</i>	<i>Highest measured process temperature</i>
<i>Z:</i>	<i>Zero adjustment</i>	<i>Tpl:</i>	<i>Lowest measured process temperature</i>
<i>S:</i>	<i>Span adjustment</i>	<i>Tah:</i>	<i>Highest measured ambient temperature</i>
<i>Da:</i>	<i>Out delay on display</i>	<i>Tal:</i>	<i>Lowest measured ambient temperature</i>
<i>O:</i>	<i>Output (4-20 mA or 20-4 mA)</i>	<i>Tc no:</i>	<i>Tag number</i>
<i>Lpro:</i>	<i>Local protection (on/off)</i>		

13 Programming the SILVER SERIES

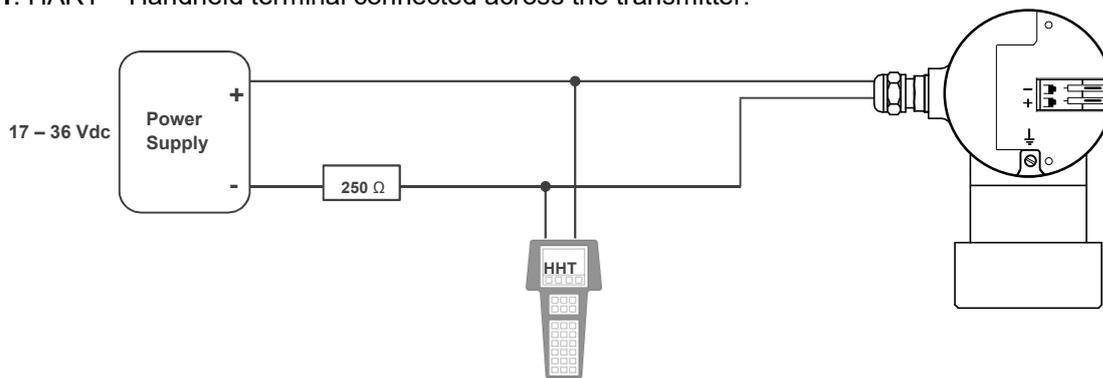


When using HART® or a Hand Held Terminal (HHT), a minimum resistance of 250 ohms **must** be present in the loop of the 2-wire system. This is necessary for proper communication (see drawing below). A power supply of at least **17 Vdc** must be used.

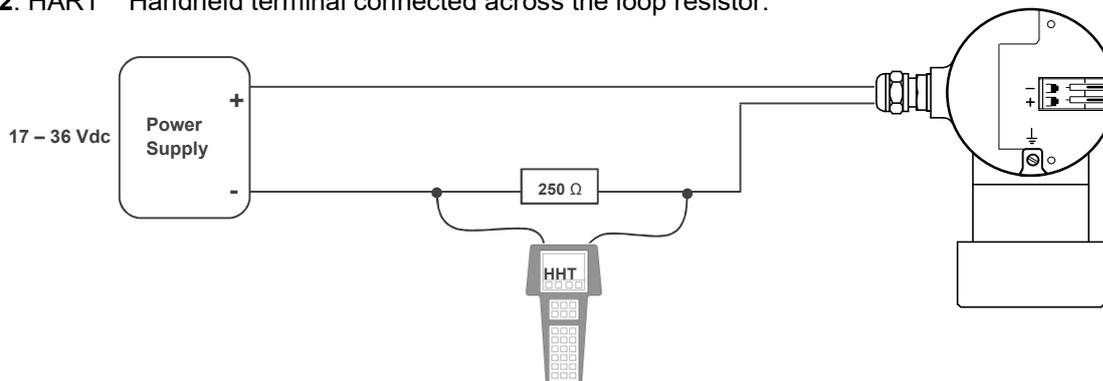
13.1 Programming with the hand held terminal

The SILVER SERIES 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 8 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 SILVER SERIES PS55 and CS55

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

This Table refers to specific documents:

Model	Description	Document
PS55/CS55	Stainless steel pressure transmitter SILVER SERIES	G5.PS55-CS55 EN

17.2 Declaration of conformity model PS55 and CS55