

# SERIES TT55



• Warning •

Read the recommendations and warnings in this manual before the instrument is installed. For personal safety, optimal use and maintenance of the Series TT 55, these instructions should be studied carefully.

**Manufactured by:**

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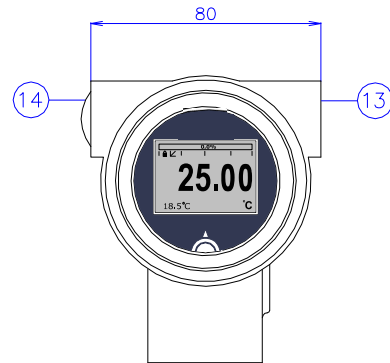
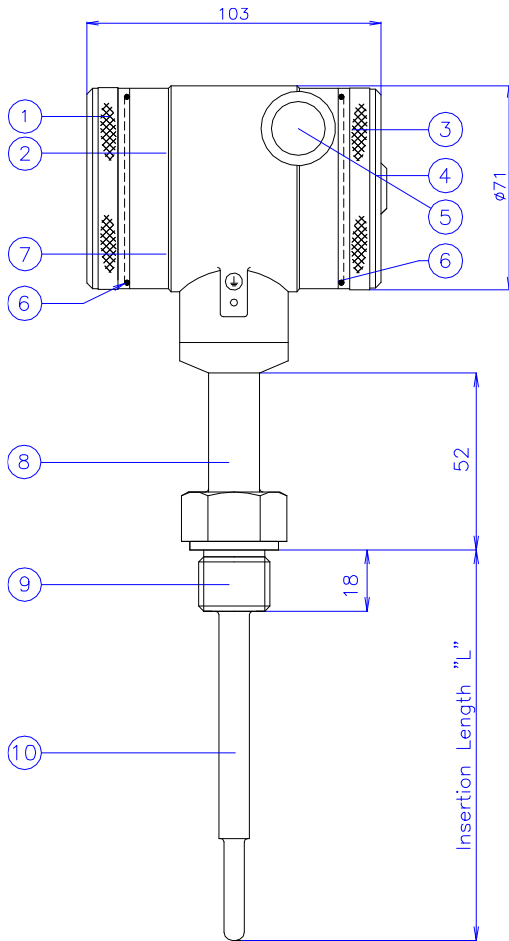
## 1. INTRODUCTION

The SERIES TT55 is a complete Stainless Steel temperature transmitter, based on a Pt100 element (½ DIN Class B). The range of standard elements can be set between -50 and 200 °C. Other ranges are available on request. The Pt100 element is mounted in a stainless steel welding nipple (sensor position 9). To obtain an accurate and fast measurement, the diameter of the insert must be as small as possible. The resistance change of the Pt100 element due to temperature is converted into a proportional 4-20 mA signal (2-wire).

Various process connections can be made including milk couplings (DN25, 40 and 50), Tri-clamp (1, 1 ½" or 2") and hygienic weld-on-nipples (¾" BSP, Ø 28 mm). Thermowells are fully welded and manufactured from bar stock. They are available in various designs and materials.

**2. DIMENSIONAL DRAWINGS**

**Series TT-55**



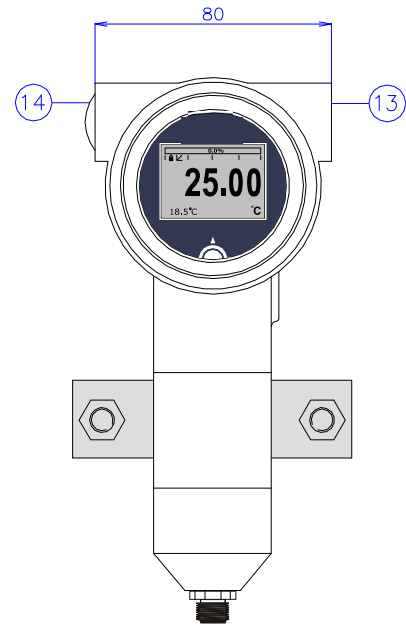
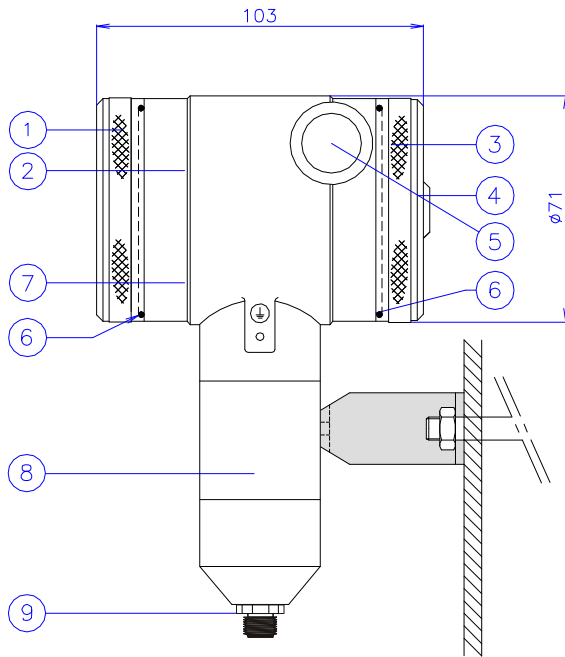
Front view: Transparent cover, option "I" (extra price)

Description	Material
① Cover	SS 304
② Display with navigation button	
③ Cover with venting	SS 304
④ Venting	PA
⑤ M20 x 1,5 cable entry (without gland) *	
⑥ O-Ring	EPDM
⑦ Electronic housing	SS 304

Description	Material
⑧ Extended connection	SS 316
⑨ Process connection	SS 304
⑩ Insert	SS 316 L
⑬ M20 x 1.5 cable entry (without gland) *	
⑭ M20 x 1.5 cable entry (Blanking plug)	PE

\* As standard the Series TT55 will be supplied with **two** cable entries M20 x 1,5. A cable gland can be supplied by request (extra costs).

**Series TT 55 - Remote**



Description	Material
① Cover	SS 304
② Display with navigation button	
③ Cover with venting	SS 304
④ Venting	PA
⑤ M20 x 1,5 cable entry (without gland) *	
⑥ O-Ring	EPDM
⑦ Electronic housing	SS 304

Description	Material
⑧ Extended connection	SS 316
⑨ M12 Connector	SS 304
⑬ M20 x 1.5 cable entry (without gland) *	
⑭ M20 x 1.5 cable entry (Blanking plug)	

\* As standard the Series TT55 will be supplied with **two** cable entries M20 x 1,5. A cable gland can be supplied by request (extra costs).

### 3. INSTALLING THE TRANSMITTER

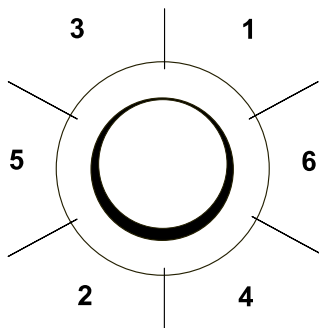
The diaphragm of the transmitter is protected with a special protection cap. Protect the diaphragm until installation takes place. **Do not damage or bend the temperature sensor.**

#### 3.1 INSTALLING WELD-ON NIPPLE

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

1. Cut a hole in the process vessel or pipe for a precise fit of the weld-on nipple. The hole should be 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.

**Remove the gasket and O-Ring out of the weld-on nipple!**



#### WARNING

**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.**

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.

4. Position the weld-on nipple in the vessel hole and tack six places. The weld sequence is shown in the figure above.
5. 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 bevelled area. Adjust amperage for penetration.
6. Remove the mandrel after the welding operation.

#### 3.2 MOUNTING POSITION

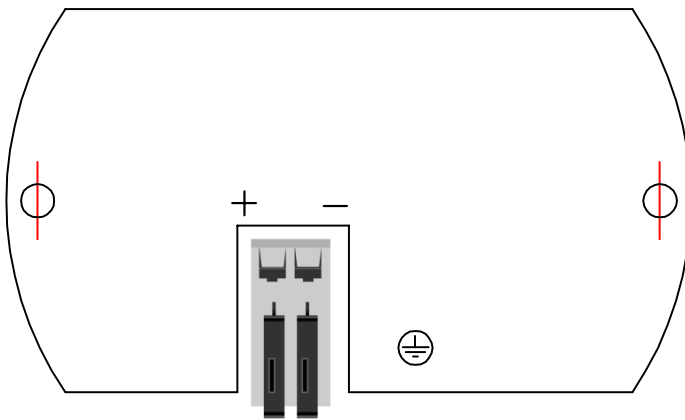
When the transmitter is mounted horizontally, the cable gland must be pointed downwards.

#### 3.6 CALIBRATION

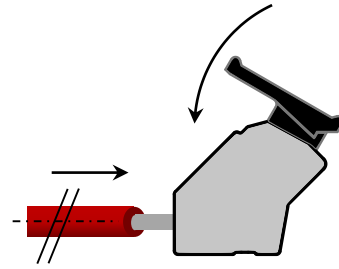
All transmitters are fully calibrated at the factory, to customer specified range. If the calibration is not specified, the transmitter will be calibrated at 0 – 100 °C.

### 3.7 WIRING

Under the cover ③ you will find the terminal board.



Illustrative side view



Insert the wires into the connector and push the lever down by hand.

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 is connected with standard two-wire shielded cable. Do not run signal wiring in open trays with power wiring, or near heavy electrical equipment (e.g. Frequency controllers or heavy pumps).

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

### 3.8 GROUNDING

The transmitter must always be connected to ground. In case the process connection is already connected to ground (e.g. by 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".**

## 4. REMAINING

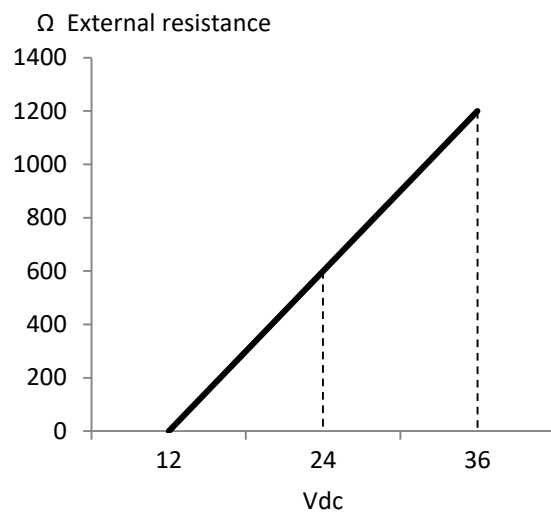
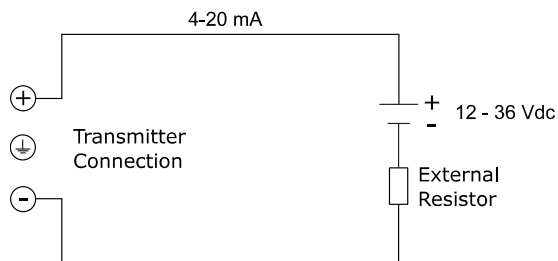
### 4.1 EXTERNAL LOAD

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<sub>I</sub> 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.



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

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



### 4.2 CE / EMC-RULES

All 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.

### 4.3 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.

Example: Serial Number 4302123. The year of manufacturing is 1970 + 43 = 2013.



#### 4.4 INTRINSICALLY SAFE (Option Ex)

The Series TT 55 is available for intrinsically safe for use in zone 0.



**ATEX – KIWA 15ATEX0031 X**  
II 1G Ex ia IIC T5...T4 Ga (-20 < T<sub>amb</sub> < 70 °C)  
II 1G Ex ia IIC T6 Ga (-20 < T<sub>amb</sub> < 31 °C)



**IECEX – KIWA 15.0014X**  
Ex ia IIC T5...T4 Ga (-20 < T<sub>amb</sub> < 70 °C)  
Ex ia IIC T6 Ga (-20 < T<sub>amb</sub> < 31 °C)

For detailed explanation see “EU-Declaration of conformity” on the last page of this manual.

For use in an **Intrinsically Safe** area, use a certified power supply from 12 - 30 Vdc. Installation of this device must be carried out by a certified mechanic or installer.

Transmitter type and options	Equipment category	Temperature Class	Ambient temperature range
Pressure / Level Transmitter Series TT55 With closed covers	II 1G	T5 ... T4	-20 °C to +70 °C  Process temperature range: -20 °C to +100 °C
Pressure / Level Transmitter Series TT55 With transparent indicator cover (Option I)	II 1G	T5 ... T4	-20 °C to +70 °C  Process temperature range: -20 °C to +100 °C
Pressure / Level Transmitter Series TT55 With closed covers	II 1G	T6	-20 °C to +31 °C  Process temperature range: -20 °C to +50 °C
Pressure / Level Transmitter Series TT55 With transparent indicator cover (Option I)	II 1G	T6	-20 °C to +31 °C  Process temperature range: -20 °C to +50 °C
Option, Electrical variant	Temperature Class	Ambient Temperature	Process Temperature
Single 4-20 mA output G190, with dual 4-20 mA Output	T4	-20° C to + 70° C	-20° C to + 100° C
G185, with single 4-20 mA output	T5	-20° C to + 70° C	-20° C to + 100° C
	T6	-20° C to + 31° C	-20° C to + 50° C

#### Electrical Data

Temperature Transmitter Series TT 55nd TT 55-Remote

Supply/output circuit (terminals + and -): in type of protection intrinsic safety Ex ia IIC only for connection to a certified intrinsically safe circuit, only with a supply range from 12 till 30 Vdc, with the following maximum values:

**U<sub>i</sub>** = 30 Vdc; **I<sub>i</sub>** = 110 mA; **P<sub>i</sub>** = 0,9 W; **L<sub>i</sub>** = 1,4 mH; **C<sub>i</sub>** = 41 nF (without cable between terminals + and -)

Temperature Transmitter Series TT-4000 and TT-4000-Remote (**Option G190**)

Supply/output circuit (terminals + and -) and a **2<sup>nd</sup>** Supply/output circuit (terminals + and -): in type of protection intrinsic safety Ex ia IIC only for connection to a certified intrinsically safe circuit, only with a supply range from 12 till 30 Vdc, separate for each output, with the following maximum values:

**U<sub>i</sub>** = 30 Vdc; **I<sub>i</sub>** = 110 mA; **P<sub>i</sub>** = 0,9 W; **L<sub>i</sub>** = 0,08 mH; **C<sub>i</sub>** = 41 nF (without cable between terminals + and -)

*The maximum values are applicable for each output. The maximum connected power for each output is 0,9 W. **Not available for T5 and T6.***

#### Instructions

The instructions provided with the equipment shall be followed in detail to assure safe operation.

#### Special conditions for Safe use in Zone 0

- As standard the transmitter is supplied **without** a certified cable gland. The cable entry is fitted with a PE blanking plug for protection during transport. Remove the blanking plug after installing the transmitter. When using a gland make sure it is certified and complying with applicable protection level of the transmitter.
- Always use the covers supplied by Ashcroft Instrument . Jiaxing
- From safety point of view, the transmitter must be connected to ground

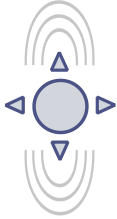
*All certifications are in compliance with ATEX and IECEX scheme rules, and the International Standards: EN IEC 60079-0: 2018, EN 60079-11: 2012, IEC 60079-0:2017 and IEC 60079-11:2011. The transmitters are certified for use in hazardous areas by KIWA Nederland B.V.*



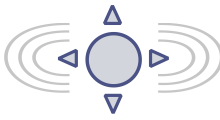
**DO NOT REMOVE OR UNSCREW THE COVER(S) WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.**

## 5. GRAPHIC DISPLAY AND NAVIGATION BUTTON

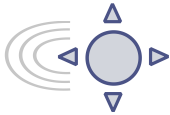
The Series TT55 has a multifunctional display where different values can be displayed simultaneously. The display is equipped with a backlight. The entire menu is controlled by a navigation button. The navigation button has the following possibilities of movement: up, down, left, and right. The navigation button needs to be pushed when conformation or saving is needed.



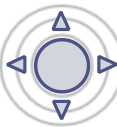
Move the navigation button up or down to browse through various menus. These movements can be distinct in choices of: program points, navigation through menu's and increase or decrease measurement value's.



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**.

Figure 1. Display Series TT55, fully rotatable (360°)



### 5.1 GRAPHIC DISPLAY READOUT

When the transmitter is powered, a flash screen with the name of the transmitter (Series TT55) and the software version appear for a few seconds. After this the home screen will show the measured value setting as set in the factory.



#### EXPLANATION OF SYMBOLS:

1. – **HART<sup>®</sup> Protocol:** Displays a HART symbol, when HART protocol option is available.
2. – **Bargraph 0-100 % from span:** Displays the percentage of the measured span.
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. – **Measurement:** Displays the temperature, percentage or a selectable unit.
6. – **Unit:** Displays the selected unit.

### 5.2 SUMMARY PROGRAMMING POINTS

PROGRAM POINT	NAME	FUNCTION
P100	Menu-Exit menu	Start and exit
P101	ZERO value	Zero adjustment (ZERO 4 mA) with or without process temperature
P102	SPAN value	Span adjustment (SPAN 20 mA) with or without process temperature
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)
P112	BURST MODE	Configuration for burst mode (Only when HART protocol is present.)
P113	INFORMATION	Contact information of Ashcroft Instruments, made settings, and software
P114	FACTORY	Only available for the manufacturer
P115	FACTORY	Only available for the manufacturer

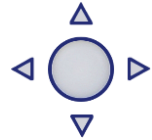
## 6. EXPLANATION PROGRAMMING POINTS

**P101**  
Zero value

**6.1 ZERO ADJUSTMENT (ZERO, 4 mA)**

The transmitter is set to 0 °C at 4 mA.

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 +10 °C.

1. The measuring unit of the transmitter is set to Celsius degrees. If not this can be selected by choosing the right measuring unit in program point **P104 – UNITS (paragraph 6.4)**
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 temperature.  
**Use process** = Configuration with process temperature.
4. Choose “**Set manual**”, +000.0 (°C) will appear on the display.
5. Increase this value with the navigation button to +10 °C, at the bottom of the screen the URV is displayed and changes according to the adjusted zero. push to confirm, and select **SAVE** to save the setting.
6. The transmitter will return to the home screen. The zero (4 mA) is adjusted to +10°C.

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 temperature 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 temperature.
3. Push the navigation button to confirm, and select **SAVE** to save the setting.
4. The transmitter will return to the main menu.

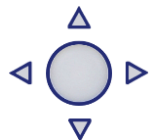
**P102**  
Span value

**6.2 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 temperature.

The maximum temperature 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 as the zero.

The following example will explained step by step.



1. Example: Measurement range +10 till +110 °C = 4 - 20 mA.
2. The **span** must be set at 100 °C.
3. The zero was set in the previous menu (**P101**) at +10°C.
4. Navigate to program point **P102 - SPAN Value**, and push the navigation button to enter the menu.
5. Two choices appear on the screen: **Set manual** and “**Use process**”
6. Choose **Set manual**, a value will appear on the screen.
7. Adjust the **SPAN** with the navigation button to +110 °C. and select **SAVE** to save the setting
8. The transmitter will return to the home screen.

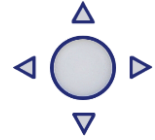
The menu span adjustment also has the option of “**use process**”. The transmitter can be adjusted to the span in a real process situation. When chosen, the transmitter will measure the temperature in an actual process. This measurement will be used as the span value. (20 mA)


1. Navigate to program point **P102**, and push the button to enter the menu.
2. Choose “**use process**”, and push to confirm. The transmitter display the measured temperature.
3. Push the navigation button to confirm, and select **SAVE** to save the setting.

**P104**  
Units

**6.4 DISPLAY SETTING OF UNITS**

Two engineering units can be displayed on the display.  
Factory setting = °C (Celsius)



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.

*For correct conversion between both temperature scales the following conversion calculation must be used.*

Celsius to Fahrenheit	$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$
Fahrenheit to Celsius	$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$

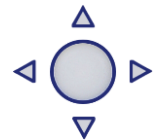



**CAUTION:** The selected temperature unit is only visible on the display, when **UNITS** is chosen in **P109 – Readout**.

**P105**  
Reverse mA

**6.5 OUTPUT SELECTION 4-20 mA or 20-4 mA**

The transmitter is standard set to 4-20 mA.

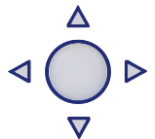




1. Navigate to program point **P105 – Reverse mA**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: **4-20 mA** and **20-4 mA**
3. Make an output choice and push to confirm.
4. The Save  icon will be displayed to indicate that the setting is saved.
5. The transmitter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

**P106**  
Damping

**6.6 DAMPING ADJUSTMENT**

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

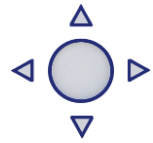



1. Navigate to program point **P106 – DAMPING**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: **Set** and **Reset**
3. Make a choice and push to confirm.
  - Choosing **Set** allows a value to be set between 0,00 and 25,00 seconds.
    - Select Set, and push 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.

**P107**  
Languages

**6.7 LANGUAGE**

In this menu the preferred menu language can be selected.

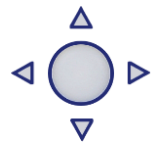


1. Navigate to program point **P107 - LANGUAGE**, and push the navigation button to enter the menu.
2. Five choices appear on the screen: **English, Dutch, Spanish, German, Russian, Polish** and **French**.
3. Make a choice and push to confirm.
4. The Save  icon will be displayed to indicate that the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

**P108**  
Device setup

**6.8 DEVICE SETUP**

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



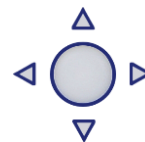
1. Navigate to program point **P108 – Device Setup**, and push the navigation button to enter the menu.
2. Eight choices appear on the screen: **Protection - Alarm output - Backlight - Temp units – Temp min/max – Sec. Value - Set Time** and **HART<sup>®</sup> Version** (*Set time and HART<sup>®</sup> version are only available when HART<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 7 Protocol*)  
An input screen to enter the date and time will appear.
  - **HART<sup>®</sup> version:** Choice between: **HART<sup>®</sup> 5.0** and **HART<sup>®</sup> 7.0**.
  - **HART<sup>®</sup> 5.0:** Means: (address is from 0 to 15)
    - address 0 -> current on 4-20mA
    - address 15 -> current fixed 4 mA
  - **HART<sup>®</sup> 7.0:** Means: (address is from 0 to 63)
    - Address 0 -> power on or off
  - **Poll address:** Can be entered. The default address is 0 with current on.


**P109**  
Readout

**6.9 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



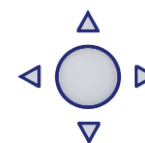
1. Navigate to program point **P109 – READOUT**, and push the navigation button to enter the menu.
2. Four choices appear on the screen:  
**Current** = Present current value (4-20mA)  
**Temperature Unit** = Unit as chosen in **P104**  
**Percentage** = 0-100%  
**Ambient Temperature** = Ambient temperature (Temperature inside the electronic housing)
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.

**P110**  
Curr sim.

**6.10 CURRENT SIMULATION (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<sup>®</sup> Protocol 3,90 mA to 20,8 mA)

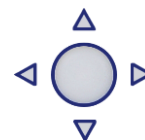


1. Navigate to program point **P110 – CURR SIMU**, and push the navigation button to enter the menu.
2. Two choices appear on the screen: “Set” and “Free”
3. Choosing **Set** allows a value to be set in five steps: 4, 8, 12, 16, 20 mA
  - By default, the current simulation is **Not active**, as shown 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.

**P112**  
Burst mode

**6.12 BURST MODE**

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



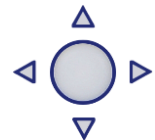
1. Navigate to program point **P115 – Burst Mode** and push the navigation button to enter the menu.
2. A message appears on the screen, push to enter this menu.
3. Three choices appear on the screen: “0”, “1” and “2”
4. With these choices, three distinct types of burst messages can be configured. Make 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 measured value rises above the triggered value.
  - **Falling** = The Burst message is triggered when measured value falls below the triggered value.
  - **On-Change** = The Burst message is triggered when any value in the measuring is changing.
 Choose the desired burst mode, and set the preferred parameters.

**P113**  
Information

**6.13 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 button to confirm.
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  
www.ashcroft.com.cn

Version	-	Software revision
No:	-	Serial number transmitter
Zero	-	Zero
Span	-	Span
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)



**6.14 FACTORY**

Only available for the manufacturer.

**6.15 FACTORY**

Only available for the manufacturer.

**7. PROGRAMMING THE SERIES TT55**

**7.1 PROGRAMMING via HART**

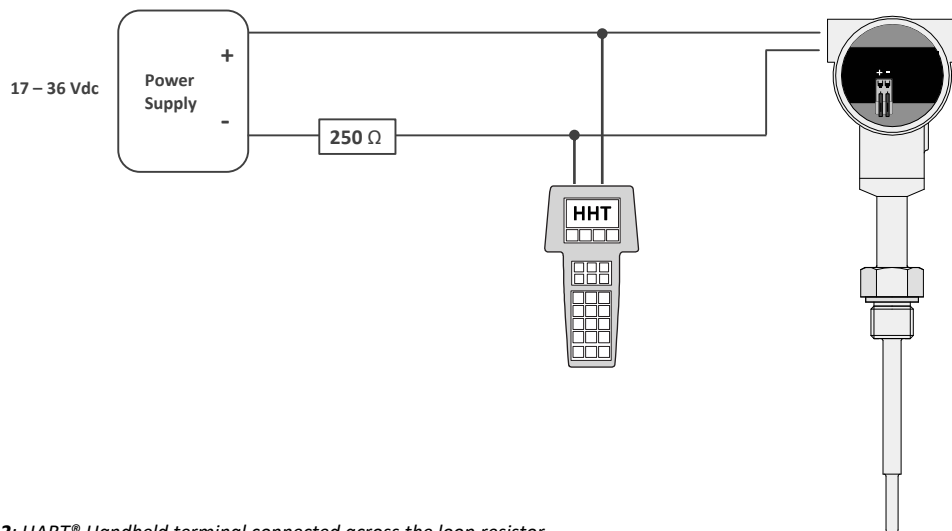


When using HART<sup>®</sup> or a Hand Held Terminal (HHT), a minimum resistance of **250 Ω** must be present in the loop of the 2-wire system. This is necessary for proper communication (see drawing below). A power supply of at least **17 Vdc** must be used.

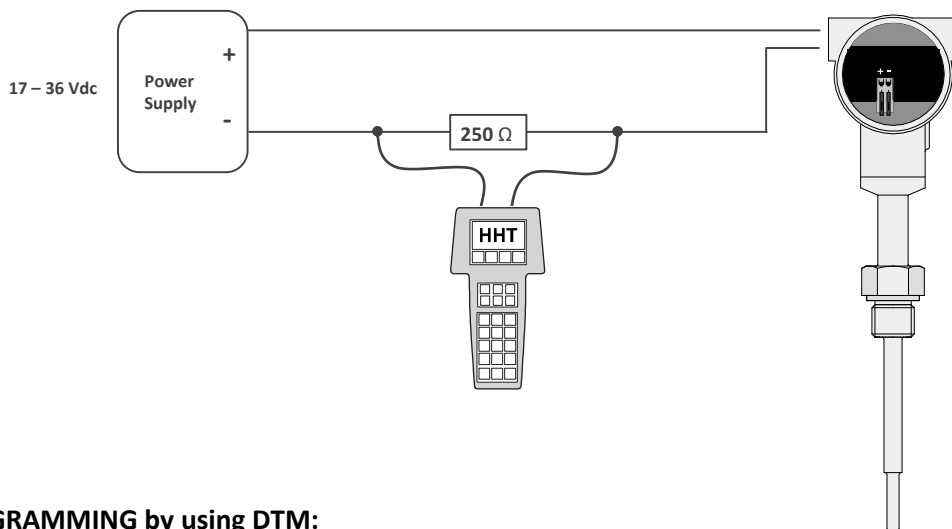
The Series TT55 can be easily programmed with the Hand Held Terminal (HHT) from the "HART<sup>®</sup> Foundation" (type 275 or 375 HART<sup>®</sup> Communicator).

**This is only possible if the option H (HART protocol) is chosen.**

*Option 1: HART<sup>®</sup> Handheld terminal connected across the transmitter.*



*Option 2: HART<sup>®</sup> Handheld terminal connected across the loop resistor.*



**PROGRAMMING by using DTM:**

There is an instruction manual available which is a guide for installing and using the Series TT55 HART DTM. This DTM is developed to make configuration changes of Series TT55 HART

transmitters easy. This DTM can be used with almost every FDT-container.

## 7.2 ROTATABLE DISPLAY

The display of the Series TT55 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. SPECIFICATIONS

<b>Manufacturer</b>	ASHCROFT
<b>Instrument</b>	TT 55
<b>Output</b>	4-20 mA Option: HART® Protocol
<b>Power Supply</b>	Standard: 12 – 36 Vdc Ex : 12 – 30 Vdc HART® : 17 – 36 Vdc (Standard) min. 250 Ω 17 – 30 Vdc (Ex) min. 250 Ω
<b>Accuracy</b>	0,075%
<b>Process Temperature</b>	Standard -50 °C to +200 °C (-58 °F to 392 °F) Ex - Temperature Class T5...T4 -20 °C to +100 °C (-4 °F to 212 °F) Ex - Temperature Class T6 -20 °C to +50 °C (-4 °F to 176 °F)
<b>Ambient Temperature</b>	Standard -20 °C to 70 °C (-4 °F to 158 °F) Ex - Temperature Class T5...T4 -20 °C to 70 °C (-4 °F to 158 °F) Ex - Temperature Class T6 -20 °C to 31 °C (-4 °F to 104 °F)
<b>Damping</b>	0,00 seconds to 25,00 seconds Standard: 0,00 seconds.
<b>Protection Grade</b>	IP66
<b>Material</b>	Housing "Wetted" parts
	AISI 304 (Optional AISI 316) AISI 316 L (Other materials on request)

## 9. PRECAUTIONS AND WARNINGS

- Check if the specifications of the transmitter meet the needs of the process conditions
- **WELDING INFORMATION:**  
When using the Series TT55 with weld-on nipple, the welding information on page 6 must be followed exactly. This is very important to prevent distortion of the weld-on nipples. It also prevents the screw thread from being deformed.
- Prevent any damaging of the transmitter.
- 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 connected on request. (The normal venting will be removed) In that case the transmitter is IP68.
- The covers ① and ③ must be fully engaged, so that moisture cannot ingress into the electronic housing.
- **WARRANTY:** The warranty is 1 year from delivery date.  
Ashcroft does not accept liability for consequential damage of any kind due to use or misuse of the Series TT55  
Warranty will be given, to be decided by the manufacturer. Transmitter must be shipped prepaid to the factory on manufacturers authorization.
- **NOTE:** Ashcroft reserves the right to change its specifications at any time, without notice. Ashcroft is not an expert in the customer's process (technical field) and therefore does not warrant the suitability of its product for the application selected by the customer.

Attachment: EU-DECLARATION OF CONFORMITY

## EU-DECLARATION OF CONFORMITY

### Ashcroft Inc.

Certify that the equipment intended for use in potentially explosive atmospheres, indicated here  
after: Electronic Pressure / Level Transmitter Series TT55  
Differential Pressure Transmitter Series DP55  
Temperature Transmitter

Are in accordance with:

- Directive 2014/34/EU (Equipment and protective systems intended for use in potentially explosive atmospheres).
- Directive 2014/30/EU (Electro Magnetic Compatibility).
- Harmonized standards:
  - EN 60079-0: 2018 (General rules)
  - EN 60079-11:2012 (Equipment protection by intrinsic safety "i")
  - EN 61326-1: 2013 (3,Electrical equipment for measurement, control and laboratory use- Part 1)
  - EN-ISO-IEC 80079-34:2018 (Potentially explosive atmospheres – Application of Quality Systems)
  - IEC 61000-6-2:2001 (EMC, Immunity in industrial location)
  - IEC 61000-6-3:2001 (EMC, Emission in industrial location)
  - IEC 61000-6-4:2001 (EMC, Emission in industrial location)
  - IEC 61298-3 (Test for the effects of influence quantities. Test 13.1 Common mode interference and 13.2 Normal mode interference (series mode)).
- The type (protection mode Intrinsic Safety “ia”) which has been the subject of;  
**EC-type Examination, Certificate Number:** KIWA 15ATEX0031 X, Issue 2  
Delivered by Kiwa Nederland B.V. (Unit Kiwa ExVision), Wilmersdorf 50, 7327 AC Apeldoorn, The Netherlands, Notified body No. 0063



The marking of the equipment for gas group for use in zone 0:

II 1 G Ex ia IIC T4 Ga or  
II 1 G Ex ia IIC T5 Ga and  
II 1 G Ex ia IIC T6 Ga

- II equipment for use in industries above ground (and not in mines endangered by firedamp).
- 1 equipment for use in Zone 0

G	equipment for use with gas, vapours or mists
Ex	equipment in compliance with European standards for explosive atmospheres
ia	equipment in compliance with specific building rules for intrinsically safe equipment
IIC	equipment for use with gas of subdivision C
T4	equipment whose surface temperature does not exceed 135°C when used in an ambient temperature < 70°C.
T5	equipment whose surface temperature does not exceed 100°C when used in an ambient temperature < 70°C.
T6	equipment whose surface temperature does not exceed 85°C when used in an ambient temperature < 31°C for the highest temperature class T6.

Ingress Protection Grade

**REMOTE: IP 66.**

Furthermore, whatever the protection mode, only use cable glands with a protection degree of at least IP 66. Be sure the cable diameter complies with the selected cable gland. Tighten the cable gland in a proper way. Never forget to mount the covers of the electronics housings in a proper way.

***For other technical details, refer to the instruction manuals of the transmitters.***