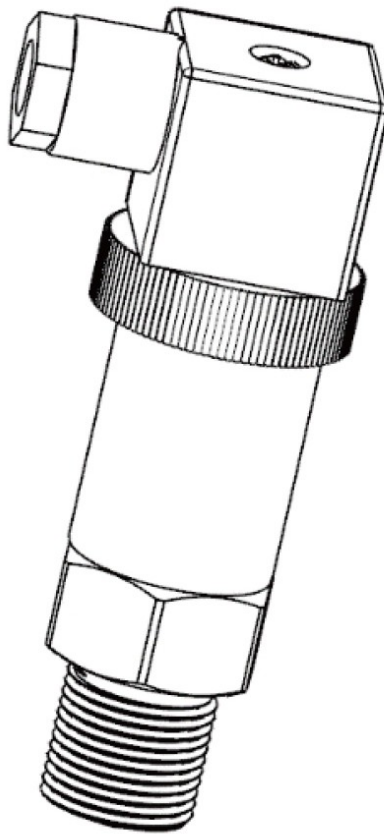


USER MANUAL

Compact Pressure Transmitter

Model SH316

Ver.213



This manual describes the installation, wiring, commissioning and maintenance of the SH316 compact pressure transmitter. For details not covered here, please contact Silver Automation Instruments.

1 About This Manual

- The contents of this manual are subject to change without prior notice.
- The specifications in this manual apply only to the standard models in the model code. They do not apply to custom-ordered instruments.

2 Warranty

Within one year from the date of delivery, we provide free repair for products that fail to meet the contract requirements because of defects in material or workmanship.

Note: Deformation of the sensing diaphragm and any other damage caused by improper use are not covered by the warranty.

3 Safe Operation

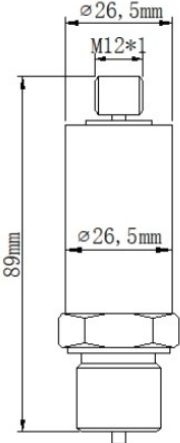
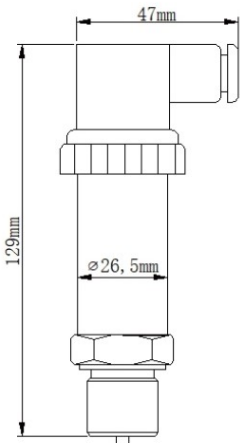
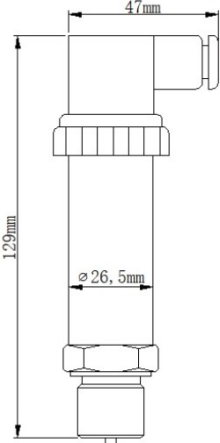
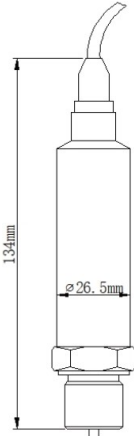
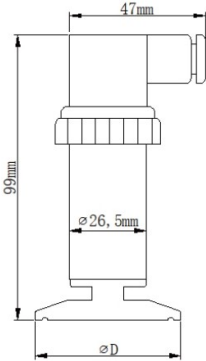
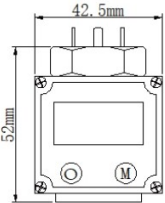
To protect operators, instruments and systems, read the precautions carefully and follow the safety rules strictly. We accept no liability for any loss caused by failure to follow the operating rules. Observe the following:

WARNING

1. Installation and wiring must be carried out by qualified engineers or technicians.
2. Check that the supply voltage matches the instrument. Make sure the power is off during wiring.
3. In applications that require explosion protection, complete all cable connections before installing the instrument in the hazardous area and applying power. Do not work on live circuits in a hazardous area. Incorrect operation can cause serious personal injury and major property damage.

4 Product Structure

Dimensions are in mm.

 Technical drawing of the M12x1 connector. It shows a cylindrical body with a diameter of $\varnothing 26,5\text{mm}$. The total height is 89mm. The top part has a diameter of $\varnothing 26,5\text{mm}$ and a thread of M12*1.	 Technical drawing of the DIN 43650A connector (4-20 mA). It shows a cylindrical body with a diameter of $\varnothing 26,5\text{mm}$. The total height is 129mm. The top part has a diameter of 47mm.	 Technical drawing of the DIN 43650A connector (Modbus RS485). It shows a cylindrical body with a diameter of $\varnothing 26,5\text{mm}$. The total height is 129mm. The top part has a diameter of 47mm.
M12x1 connector (4-20 mA)	DIN 43650A connector (4-20 mA)	DIN 43650A connector (Modbus RS485)
 Technical drawing of the Direct cable outlet. It shows a cylindrical body with a diameter of $\varnothing 26,5\text{mm}$. The total height is 134mm.	 Technical drawing of the DIN connector, tri-clamp type. It shows a cylindrical body with a diameter of $\varnothing 26,5\text{mm}$. The total height is 99mm. The top part has a diameter of 47mm. The base has a diameter of $\varnothing D$.	 Technical drawing of the Digital display module. It shows a rectangular module with a width of 42.5mm and a height of 52mm. It has a display screen and two buttons labeled 'O' and 'M'.
Direct cable outlet	DIN connector, tri-clamp type	Digital display module
Note: The standard tri-clamp diameter D is 50.5 mm or 64 mm.		

5 Installation

5.1 Mounting Position

- **Gas:** Mount the transmitter on the top of the pipe.
- **Liquid:** Mount the transmitter on the side or bottom of the pipe.

5.2 Mounting Method

When the process connection is threaded or tri-clamp mounted on the pipe (or vessel wall), no mounting bracket is required. The mounting position may cause a zero offset. This offset can be corrected and does not affect the span.

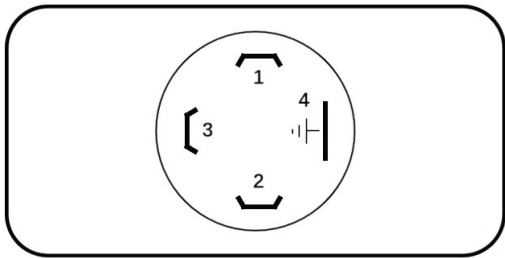
5.3 Precautions

1. Do not install the transmitter directly in the flow stream or where pressure surges occur.
2. Install the transmitter in a ventilated, dry place away from strong magnetic fields. For outdoor installation, protect it from direct sunlight and rain.

6 Wiring

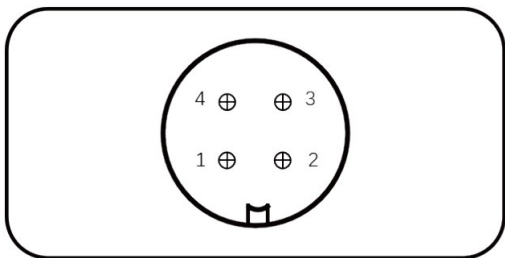
The transmitter is available with a DIN connector, an M12 connector or a direct cable outlet. Wire it as shown below.

6.1 DIN 43650 (A/B) Connector



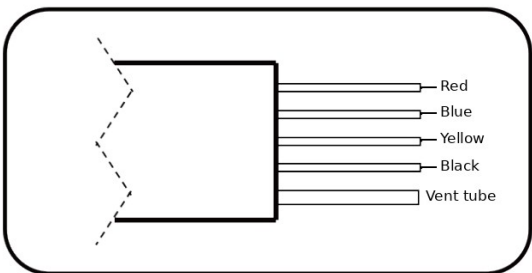
	1	2	3	4
2-wire	V+	V-		
3-wire	V+	GND	Signal+	
RS485	V+	V-	A	B

6.2 M12×1 Connector



	1	2	3	4
2-wire	V+	V-		
3-wire	V+	V-	Signal+	
4-wire	V+	V-	Signal+	Signal-
RS485	V+	V-	A	B

6.3 Direct Cable Outlet



	Red	Blue	Yellow	Black
2-wire	V+	V-		
3-wire	V+	V-	Signal+	
4-wire	V+	V-	Signal+	Signal-
RS485	V+	V-	A	B

7 Commissioning

7.1 Zero Adjustment

For models with a DIN connector and a range below 100 kPa, zero adjustment can be done on site.

Tools required: one flat-blade screwdriver and one ammeter (multimeter).

Procedure:

1. Remove the DIN connector.
2. Power on the transmitter, then connect the ammeter.
3. Turn the Z potentiometer on the circuit board with the screwdriver (see Figure 1) until the output signal reaches zero.

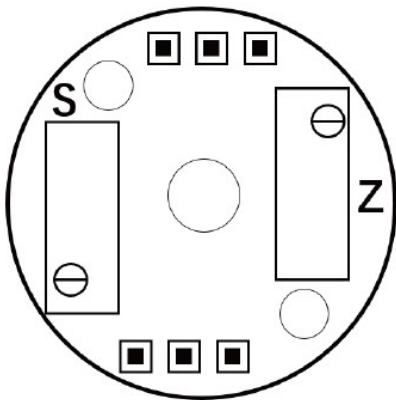


Figure 1. Position of the Z potentiometer on the circuit board

8 Digital Display Module

The digital display module is an optional accessory. It is operated with two keys.

8.1 Keys

Key	Name	Function in setting menus
O	Option	Switches between menus and moves the flashing digit.
M	Modify	Enters a menu, changes the flashing digit, executes and modifies settings.

8.2 Basic Operation

- In any menu except the advanced settings, press and hold O for 3 seconds to save the current setting and exit.
- If no key is pressed for 10 seconds in any setting menu, the display returns to measurement mode automatically.
- In measurement mode, press O once to show the present current value for 3 seconds. For example, 15.23 means the present current is 15.23 mA. The display then returns to measurement mode.

8.3 Measurement Setting Menu

Password: 0011

1. In measurement mode, press O and M together for 3 seconds to enter password mode.
2. Press O to move to the next digit. Press M to increase the digit value. Set the value to 0011.
3. Press and hold O to enter the measurement setting menu.
4. In this menu, press O to scroll through the submenus. Press M to enter the selected submenu.

Menu	Function	Operation
 SE-1	Display value at 4 mA	Press O to select the flashing digit. Press M to increase it. If you pass the target value, keep pressing M to cycle round again. Press and hold O for 3 seconds to save and exit. <i>Example:</i> 
 SE-2	Display value at 20 mA	Set in the same way as SE-1.
 SE-3	Decimal point	Press M to move the decimal point. Press and hold O for 3 seconds to save and exit. <i>Example:</i> 
 SE-4	Unit symbol	Press M to move the unit symbol position. Press and hold O for 3 seconds to save and exit. Note: this menu is available on LCD models only.

9 Repair and Troubleshooting

If the instrument fails, contact the after-sales service of Silver Automation Instruments. If the transmitter needs to be returned for repair, please provide the following information:

- Description of the site environment
- Description of the fault
- Process medium and its physical and chemical properties

Important: Before returning the instrument for repair or calibration, remove all residual medium. This is essential for substances harmful to health, such as corrosive, toxic or radioactive substances.

9.1 Common Faults

Symptom	Possible cause	Remedy
No display or no output signal	No power supply or incorrect wiring.	Supply power correctly according to the wiring diagram.
Display or output fluctuates irregularly while pressure is constant	Housing ground terminal not connected. Strong RF interference at site. Unshielded cable used.	Use shielded cable and ground the shield. Connect the housing ground terminal reliably to earth.
Display is not 0 kPa, or output is not at the zero value, with no pressure applied	The transmitter is not operating in the required environment.	Move the transmitter to the specified environment, or take measures to make the environment meet the requirements. If the offset is caused by the mounting position, perform a zero adjustment.
Display or output does not match the measured pressure	Incorrect supply voltage. External load too high.	Connect a separate 24 VDC supply and check whether the output is stable.

If the fault is not listed above, please contact the after-sales service of Silver Automation Instruments.

10 Maintenance

- Clean the transmitter only with neutral cleaning agents. Do not use corrosive agents such as acids, alkaline solvents or household detergents.
- Protect the sensing diaphragm from mechanical damage during cleaning. Do not clean the diaphragm with a high-pressure water or air jet.

11 Transport and Storage

- Handle with care during transport. Do not turn the product upside down, and protect it from rain, direct sunlight and strong shock or vibration.
- Store the product in its original packaging at -40 °C to 80 °C and below 90% RH. Keep it away from corrosive or other harmful gases.

Contact Us

For technical support, spare parts or after-sales service, please contact:

	Silver Automation Instruments Ltd. Room 1211, No. 108 Jiangdong Middle Road, Jianye District, Nanjing, Jiangsu, China Tel: +86-25-52155837 E-mail: inquiry@silverinstruments.com Web: www.silverinstruments.com
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