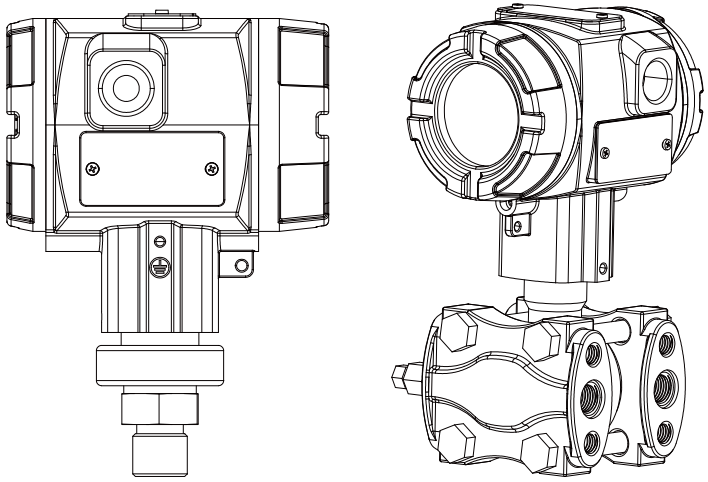
ZHEJIANG LEFOO SENSING TECHNOLOGY CO., LTD.

Http：//www.lefoogroup.com TEL：+86-571-89363666

ADD：No.118, Changda Road, Linping District, Hangzhou, Zhejiang 311100, China.

LEFOO

MONOCRYSTALLINE SILICON PRESSURE/DIFFERENTIAL PRESSURE TRANSMITTER



User Manual

WARNING

1.Place the Monocrystalline silicon pressure/Differential pressure transmitter horizontally before calibration.

2.After installation on site, perform zero adjustment on the transmitter.

3.Ensure the process connections are properly installed and tightened before pressurizing.

4.Install the transmitter in a dry environment. Avoid exposure to rain. Use a protective enclosure in harsh environments.

5.Do not disassemble the transmitter without authorization.

6.Do not remove the transmitter cover in explosive or flammable environments while powered.

7.Verify that the power supply voltage meets the requirements specified in this manual.

8.The external ground screw of the transmitter must be securely connected to the ground.

9.Installation in explosive environments must comply with international, national, and local regulations. Refer to the explosion-proof section of this manual.

10.For HART communication calibration and temperature compensation, only use communication equipment and software provided by our company.

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INTRODUCTION

The Monocrystalline silicon pressure/differential pressure transmitters produced by our company are multifunctional digital instruments, meticulously designed based on advanced, mature, and reliable smart sensor technology, combined with cutting-edge microcontroller technology and sensor signal conversion techniques.

The core component is a microcontroller, whose powerful functionality and high-speed computing capability ensure the superior quality of theMonocrystalline silicon pressure/differential pressure transmitter. The entire design framework focuses on reliability, stability, high accuracy, and intelligence.

Equipped with powerful interface operation functions, the digital display can show pressure, percentage, current, and provide a 0–100% analog indication. The keypad allows for easy setting of basic parameters such as zero adjustment, range setting, and damping configuration—even in the absence of a standard pressure source—greatly facilitating on-site commissioning.

High-performance chips are used for signal conversion, signal acquisition and processing, as well as current output control, endowing the Monocrystalline silicon pressure/Differential pressure transmitter with characteristics such as stability, reliability, and vibration resistance, along with excellent interchangeability.

I. OVERVIEW

1.1 Overview

The Monocrystalline silicon Pressure/Differential Pressure Transmitter (hereinafter referred to as “transmitter”) utilizes a smart sensor chip manufactured with advanced German MEMS technology and features built-in temperature compensation components. It offers solutions ranging from basic pressure measurement to complex differential pressure measurement, characterized by high accuracy, stability, and flexibility.

This transmitter is suitable for a wide range of industrial pressure monitoring applications. It supports local operation via a three-button interface, or configuration and adjustment using a handheld communicator or configuration software. All operations can be performed without affecting the 4–20 mA DC output signal, ensuring reliability and ease of use under various application conditions.

The Monocrystalline silicon pressure/differential pressure transmitters are available in seven different models:LFT700 – Pressure Transmitter, LFT701 – Flush Diaphragm Pressure Transmitter, LFT703 – Clamp-Type Pressure Transmitter, LFT705 – Flange-Type Pressure Transmitter, LFT710 – Differential Pressure Transmitter, LFT715 – Single-Flange Differential Pressure Transmitter, LFT720 – Double-Flange Differential Pressure Transmitter

For simplicity, these models may be referred to by their model numbers only: LFT700, LFT701, LFT703, LFT705, LFT710, LFT715, LFT720.

The LFT700, LFT701, LFT703, and LFT705 transmitters can precisely measure the pressure of liquids, gases, or steam, and convert it into a standard 4–20 mA DC output signal. They are widely used in industrial fields such as petroleum, chemical engineering, electric power, and hydrology.

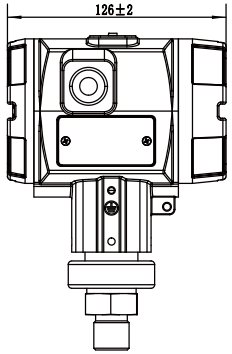
The LFT710 Differential Pressure Transmitter is used to measure the differential pressure of liquids, gases, or steam and convert it into a 4–20 mA DC output signal. It is applicable to a variety of sectors including industrial process control, automated manufacturing, aerospace, automotive and marine industries, petroleum and petrochemical, electronics and electric power, as well as healthcare.

The LFT715 Single-Flange Differential Pressure Transmitter and LFT720 Double-Flange Differential Pressure Transmitter consist of an LFT710 transmitter combined with a welded mounting flange. The pressure between the flange and the sensor is transmitted via a filling fluid such as silicone oil. These configurations effectively prevent the influence of the measured medium via impulse piping, such as crystallization, solidification, vaporization, condensation, and fractionation. They are designed to measure the pressure of liquids, gases, or steam and convert it into a standard 4–20 mA DC output signal. Their operating principle is the same as that of the LFT710, except that the pressure from the high-pressure or low-pressure side first passes through the flange diaphragm and filling fluid before reaching the high- or low-pressure side of the measurement sensor in the main transmitter body.

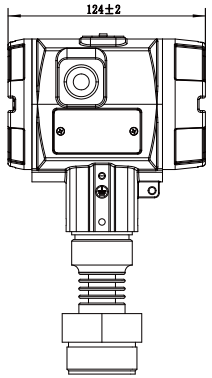
1.2 Standard Specifications

(Calibrated based on standard zero point; diaphragm material: 316L stainless steel; filling fluid: silicone oil)

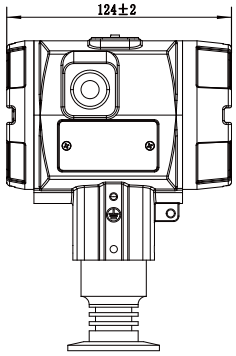
1.3 Dimension



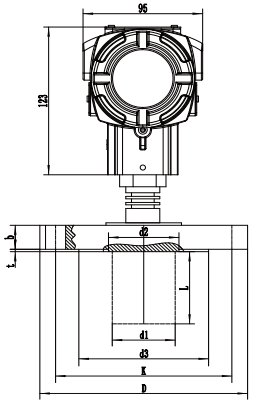
LFT700-Pressure Transmitter



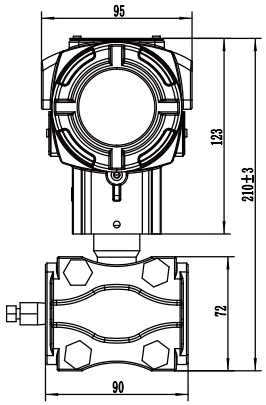
LFT701-Flush Membrane Pressure Transmitter



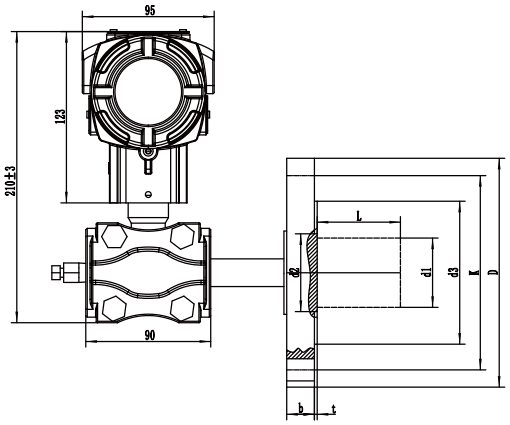
LFT703-Clamp-type pressure Transmitter



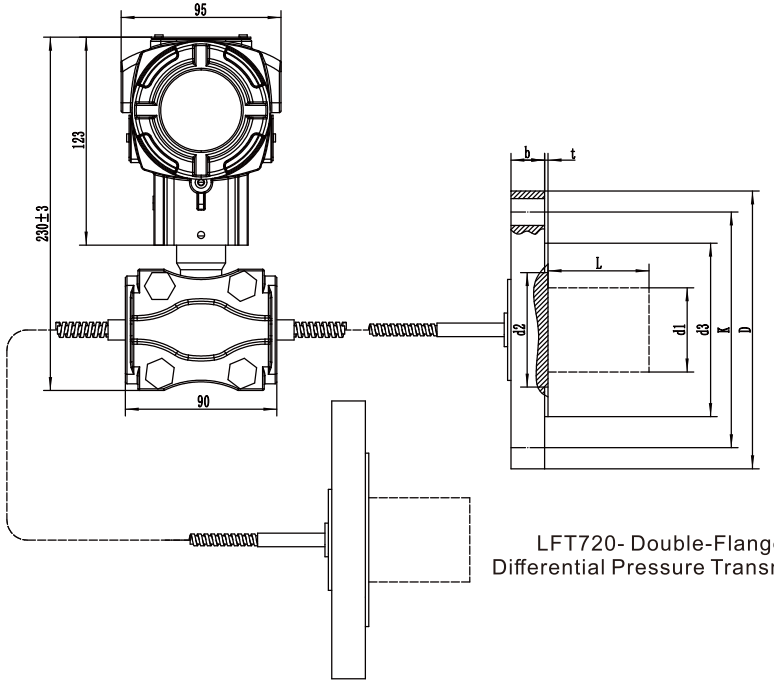
LFT705-Flange Pressure Transmitter



LFT710-Differential Pressure Transmitter



LFT715-Single-Flange Differential Pressure Transmitter



LFT720- Double-Flange Differential Pressure Transmitter

II. SPECIFICATION

2.1 LFT700-Pressure Transmitter Specification

Measurement Range and Limit

Product Type	Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)	*Overload
Gauge pressure	6KPa	600Pa	-6KPa	6KPa	40KPa
	40KPa	4KPa	-40KPa	40KPa	100KPa
	250KPa	25KPa	-100KPa	250KPa	625KPa
	1MPa	100KPa	-100KPa	1MPa	2.5MPa
	3MPa	300KPa	-100KPa	3MPa	7.5MPa
	10MPa	1MPa	-100KPa	10MPa	20MPa
Absolute pressure	250KPa	100KPa	0KPa	250KPa	625KPa
	1MPa	100KPa	0KPa	1MPa	2.5MPa
	3MPa	100KPa	0KPa	3MPa	7.5MPa
Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span					
* Overpressure Limit Value: This value is determined by the pressure rating of the weakest pressure-bearing component. It represents the maximum pressure the sensor itself can withstand, rather than the maximum pressure the entire product can endure.					

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.075% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.			
Reference accuracy	TD≤5	±0.075%	6KPa、40KPa、250KPa、1MPa、3MPa、10MPa
	TD>5	±(0.0025+0.0145TD)%	
Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】			

Ambient temperature influence

Type	Impact	Range
Gauge pressure	±(0.075+0.0375TD)% 10℃ of SPAN	6KPa、40KPa、250KPa、1MPa、3MPa、10MPa
Absolute pressure	±(0.145+0.0025TD)% 10℃ of SPAN	250KPa、1MPa、3MPa

2.2 LFT701-Flush membrane transmitter specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)	*Overload
40KPa	4KPa	-40KPa	40KPa	60KPa
250KPa	25KPa	-100KPa	250KPa	375KPa
1MPa	100KPa	-100KPa	1MPa	1.5MPa
3MPa	300KPa	-100KPa	3MPa	4.5MPa
Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span				
* Overpressure Limit Value: This value is determined by the pressure rating of the weakest pressure-bearing component. It represents the maximum pressure the sensor itself can withstand, rather than the maximum pressure the entire product can endure.				

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.075% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.			
Reference accuracy	TD≤5	±0.075%	40KPa、250KPa、1MPa、3MPa
	TD>5	±(0.0025+0.0145TD)%	
Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】			

Ambient Temperature Influence

Impact	Range
±(0.075+0.0375TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa

2.3 LFT703-Clamp-type pressure transmitter specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)	*Overload
40KPa	4KPa	-40KPa	40KPa	100KPa
250KPa	25KPa	-100KPa	250KPa	625KPa
1MPa	100KPa	-100KPa	1MPa	2.5MPa
3MPa	300KPa	-100KPa	3MPa	7.5MPa
Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span				
* Overpressure Limit Value: This value is determined by the pressure rating of the weakest pressure-bearing component. It represents the maximum pressure the sensor itself can withstand, rather than the maximum pressure the entire product can endure.				

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.075% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.			
Reference accuracy	TD≤5	±0.075%	40KPa、250KPa、1MPa、3MPa
	TD>5	±(0.0025+0.0145TD)%	
Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】			

Ambient Temperature Influence

Impact	Range
±(0.075+0.0375TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa

2.4 LFT705-Flange Pressure Transmitter Specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)
40KPa	4KPa	-40KPa	40KPa
250KPa	25KPa	-100KPa	250KPa
1MPa	100KPa	-100KPa	1MPa
3MPa	300KPa	-100KPa	3MPa
10MPa	1MPa	-100KPa	10MPa
Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span			
* Overpressure Limit Value: This value is determined by the pressure rating of the weakest pressure-bearing component. It represents the maximum pressure the sensor itself can withstand, rather than the maximum pressure the entire product can endure.			

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.2% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.		
Linear output accuracy	±0.2%	40KPa、250KPa、1MPa、3MPa、10MPa
Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】		

Ambient Temperature Influence

Impact	Range
±(0.375+0.125TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa、10MPa

2.5 LFT710-Differential Pressure Transmitter Specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)	*Static pressure range	*One-way high pressure terminal overload	*One-way low pressure terminal overload
6KPa	600Pa	-6KPa	6KPa	10MPa	600KPa	600KPa
40KPa	400Pa	-40KPa	40KPa	10MPa	5MPa	5MPa
250KPa	2.5KPa	-250KPa	250KPa	10MPa	10MPa	10MPa
1MPa	10KPa	-1MPa	1MPa	10MPa	10MPa	10MPa
3MPa	30KPa	-3MPa	3MPa	10MPa	10MPa	10MPa

Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span

* Overpressure Limit Value: This value is determined by the pressure rating of the weakest pressure-bearing component. It represents the maximum pressure the sensor itself can withstand, rather than the maximum pressure the entire product can endure.

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.075% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.

Reference accuracy	TD≤5	±0.075%	6KPa、40KPa、250KPa、1MPa、3MPa
	TD>5	±(0.0025+0.0148TD)%	

Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】

Ambient Temperature Influence

Impact	Range
±(0.1+0.05TD)% 10℃ of SPAN	6KPa
±(0.075+0.0375TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa

Static pressure effect

Zero point impact	±0.15%TD/10MPa
Full scale impact	±0.2%TD/10MPa

2.6 LFT715-Single flange differential pressure transmitter Specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)
40KPa	10KPa	-40KPa	40KPa
250KPa	25KPa	-100KPa	250KPa
1MPa	100KPa	-100KPa	1MPa
3MPa	300KPa	-100KPa	3MPa

Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.2% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.

Linear output accuracy	±0.2%	40KPa、250KPa、1MPa、3MPa

The square root accuracy is 1.5 times the linear output accuracy above

Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】

Ambient Temperature Influence

Impact	Range
±(0.375+0.125TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa

2.7 LFT720-Double flange differential pressure transmitter specification

Range and range limits

Nominal Range	Minimum Range	Lower range limit (LRL)	Upper range limit (URL)
40KPa	10KPa	-40KPa	40KPa
250KPa	25KPa	-100KPa	250KPa
1MPa	100KPa	-100KPa	1MPa
3MPa	300KPa	-100KPa	3MPa
Requirements for Setting Upper and Lower Range Values:The Lower Range Value (LRV) and Upper Range Value (URV) must be within the specified measurement range limits.When |URV| ≥ |LRV|, it must satisfy: |URV| ≥ Minimum Span; When |URV| ≤ |LRV|, it must satisfy: |LRV| ≥ Minimum Span			

Performance Indicator

Overall performance includes, but is not limited to, the combined error from reference accuracy, static pressure effects, ambient temperature effects, and other influencing factors.

* Typical Accuracy: ±0.2% of Upper Range Limit (URL)
* Long-term Stability: ±0.2% of URL per year

Reference accuracy

Based on standards and test bench conditions, including linearity (BFSL), hysteresis, repeatability. Calibration temperature: 20℃±5℃, based on zero value calibration.		
Linear output accuracy	±0.2%	40KPa、250KPa、1MPa、3MPa
The square root accuracy is 1.5 times the linear output accuracy above		
Note: TD (Turndown) refers to the range ratio and is defined as:TD = Maximum Range / Current Range,【where:Maximum Range=URL (Upper Range Limit; the range starting from zero, same as the factory calibration range)Current Range=SPAN (equivalent to |URV−LRV|)】		

Ambient Temperature Influence

Impact	Range
±(0.375+0.125TD)% 10℃ of SPAN	40KPa、250KPa、1MPa、3MPa

2.8 Specifications of Monocrystalline silicon pressure/differential pressure transmitter

Output signal

Signal	Type	Output
4~20mA	Linear	Two-wire system
4~20mA+HART	Linear	Two-wire system
RS485	Linear	Four-wire system

Time Indicator

Total damping time constant: equal to the sum of the damping time constants of the electronic circuit components and the sensor diaphragm box
Electronic circuit component damping time: adjustable from 0s to 60s
Sensing diaphragm box (sensing isolation diaphragm and silicone oil filling liquid) damping time: ≤0. 2s (Note: This item is related to the base meter sensor and whether there is a diaphragm component in the front section)
Power-on start-up time after power failure: ≤6s
Data recovery time to normal use: ≤10s

Environmental condition

Project	Operating condition
Operating ambient temperature range	With display: -20~70℃
Storage ambient temperature range	-40~85℃
Measuring medium temperature range	-20~70℃
Operating environment humidity range	5-100%RH@40℃
Protection level	IP65/IP67
Hazardous occasion	Ex db IIC T6Gb
*Please consult an engineer for details	

Power Supply Impact

When the supply voltage varies within the specified power supply range, the change in zero and span should not exceed ±0.005% of URL per volt.

Installation location impact

Install at any position, the maximum value is no more than 400 Pa , which can be corrected by the zeroing function

Vibration Impact

By GB /T 2423.10-2019 test, <0.1% SPAN

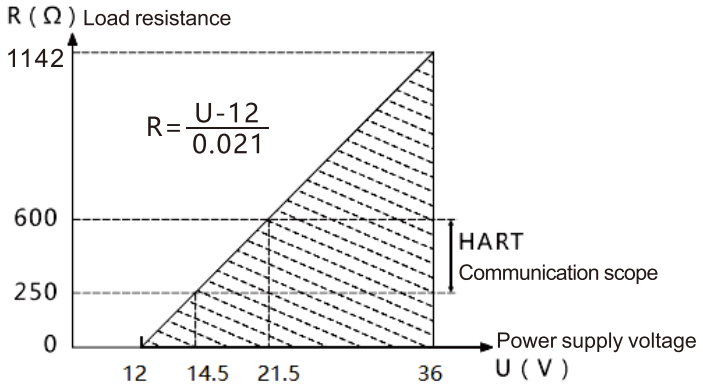
Weight

Net weight: Approx. 1.5 kg (without mounting bracket, process connection accessories)

Power supply

Project	Operating condition
Supply voltage	Flameproof type: 12~30VDC
	4~20mA:12~36VDC
	4~20mA+HART:14.5~36VDC
	Modbus-RTU/RS485:12~36 VDC
Load resistance	0Ω~1142Ω is working state, 250Ω~ 600Ω HART communication
Transmission distance	<1000 m
Power consumption	
4~20mA	≤500mW@24VDC，20.8mA
Modbus-RTU/RS485	≤240mW@24VDC，10mA

Power supply and load condition



III. MENU FUNCTIONS

3.1 Menu Function

Process Unit

Process Unit	Illustrate	Illustrate	Illustrate
inH2O	inches of water @ 4°C	Torr	Trust
inHg	inches of mercury @ 0°C	atm	Standard atmospheric pressure
ftH2O	feet of water @4°C	Mpa	MPa
mmH2O	mm water @4°C	mH20	Meters of water @4°C
mmHg	mmHg@0°C	mHg	Meters of mercury @ 0°C
psi	Pounds per square inch	m	Meter
bar	bar	mm	Millimeters
mbar	millibar	cm	Centimeter
g/cm2	g/cm2	%	Show Percentage
kg/cm2	Kg/cm2	mA	Display current value
pa	Pa	g/cm3	g/cm3
kpa	kPa		

Damping value

Unit	Setting Range
S	0~60

Output Characteristic

Parameter	Signal Type
Liner	Linear Output
Square Root	Square Root Output

Fault alarm signal

Parameter	Fault alarm signal output
High	20.8mA
Low	3.8mA
Keep	Maintain the effective current value before the fault
None	Saturated output to 20.8mA or saturated output to 3.8mA

Current fixed

Parameter	Output fixed current value
3.8mA	Fixed at 3.8mA
4.0mA	Fixed to 4mA
8.0mA	Fixed to 8mA
12.0mA	Fixed to 12mA
16.0mA	Fixed at 16mA
20.0mA	Fixed at 20mA
20.8mA	Fixed at 20.8mA

Display and operating module

Figure 1: Non-Display Panel Diagram

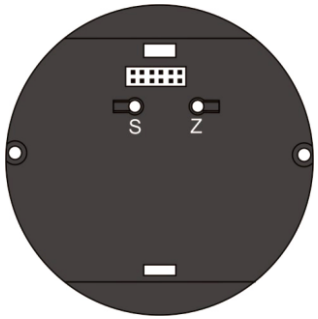
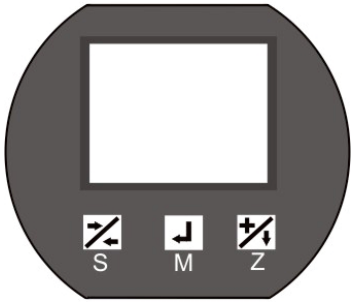


Figure 2: LCD Display Panel Diagram



Key Description

Button Icons	Button Name	Key functions
	S	In menu mode, it is the return function. In parameter setting mode, it is the return function. For the shift function, this button also has the 3.2-point S button function.
	M	Menu and parameter confirmation buttons.
	Z	In the menu state, it is to select the function; in the parameter setting state, it is+1 function, this key also has 3.2 items of Z key function.

Quick function (only 4~20 mA /4~20 mA + Hart)

No LCD display transmitter button operation

When the transmitter has no display, the following operations can be performed using the buttons S and Z on the circuit board (as shown in Figure 1): Operation (485 type does not have this function)

Clear

The transmitter is powered on and in a zero pressure state. Press and hold the S and Z buttons for more than 5 seconds. Then release the two buttons at the same time, press and hold the two buttons again for about 2 seconds, and the transmitter will clear the current pressure value. zero.

Lower limit calibration (zero active migration)

Make sure the transmitter is powered on and under pressure at the lower limit of the range : Press and hold the S and Z buttons simultaneously for 5 seconds Then release both buttons at the same time, and press and hold the Z button for about 2 seconds. The transmitter will use the current pressure as the lower limit of the range , but the range of the transmitter will not change. For example: the range of the transmitter is 0-5 kPa The current pressure is -1 kPa , When the implementation After this operation, the measuring range of the transmitter changes to -1-4 kPa.

Upper limit calibration (full point calibration)

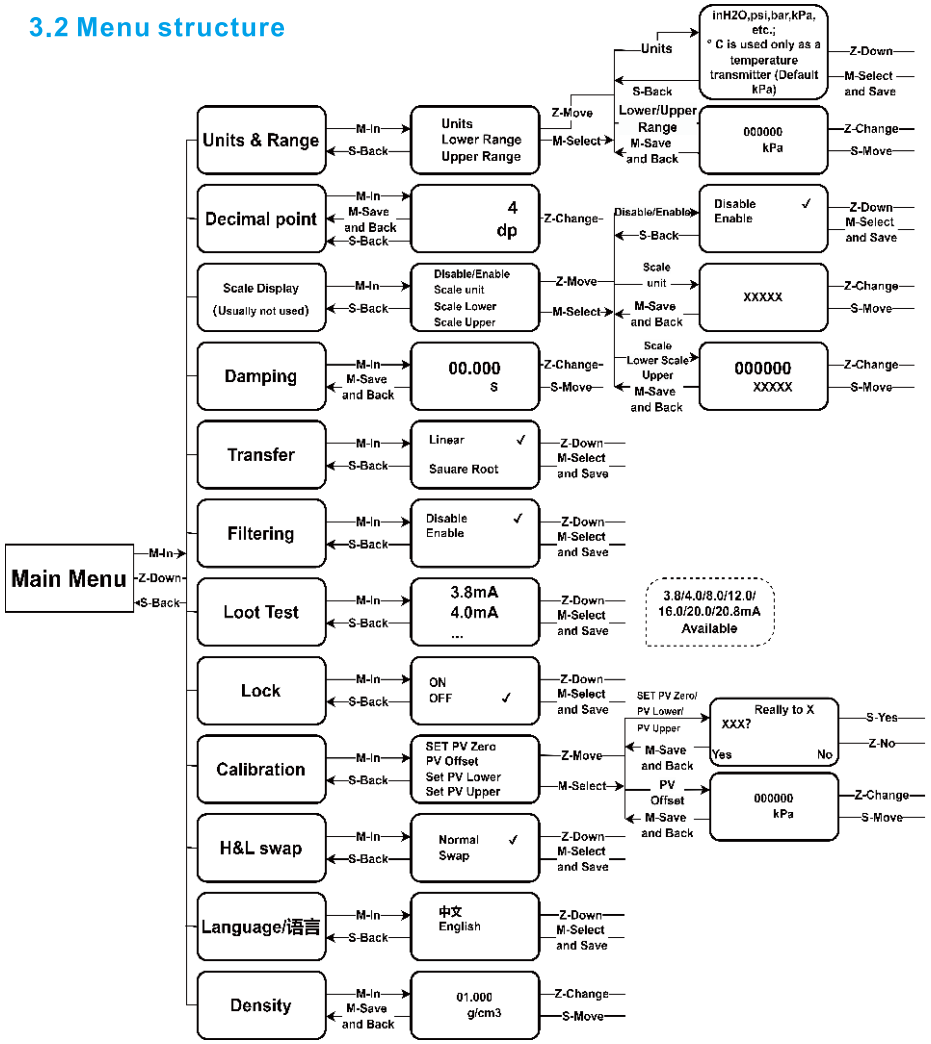
Make sure the transmitter is powered on and under pressure at the upper limit of the range, and press and hold the S and Z buttons for 5 seconds. Then release both buttons at the same time, and press the S button again for about 2 seconds! The transmitter uses the current pressure as the upper limit of the range , but the lower limit of the transmitter will not change. For example: the transmitter range is 0-5 kPa The current pressure is 4kPa, After performing this operation, the measuring range of the transmitter changes to 0-4 kPa.

Transmitter with LCD display and button operation

When the transmitter is equipped with a liquid crystal display, it can not only realize the above-described operations, but also The three buttons on the LCD display head are used to set the parameters of the transmitter. Please refer to Figure 2 for the buttons.

Note: If the transmitter parameters cannot be modified, please set the menu item "Write Protection" to "Off".

3.2 Menu structure



4~20mA Menu Structure

1. Upper/Lower Range Limits:
This setting is used to adjust the upper and lower range values. Adjust according to actual measurement requirements.Note: Both the upper and lower range limits must be within the product's measurement span.

2. Damping Time:
This setting defines the time interval from sampling to output. Select an appropriate damping time based on required measurement accuracy, the measured medium, container conditions, and pressure range.A suitable damping time can reduce noise interference and filter out abnormal values.Default damping time is 0.2 seconds, and the minimum adjustable value is 0 seconds.

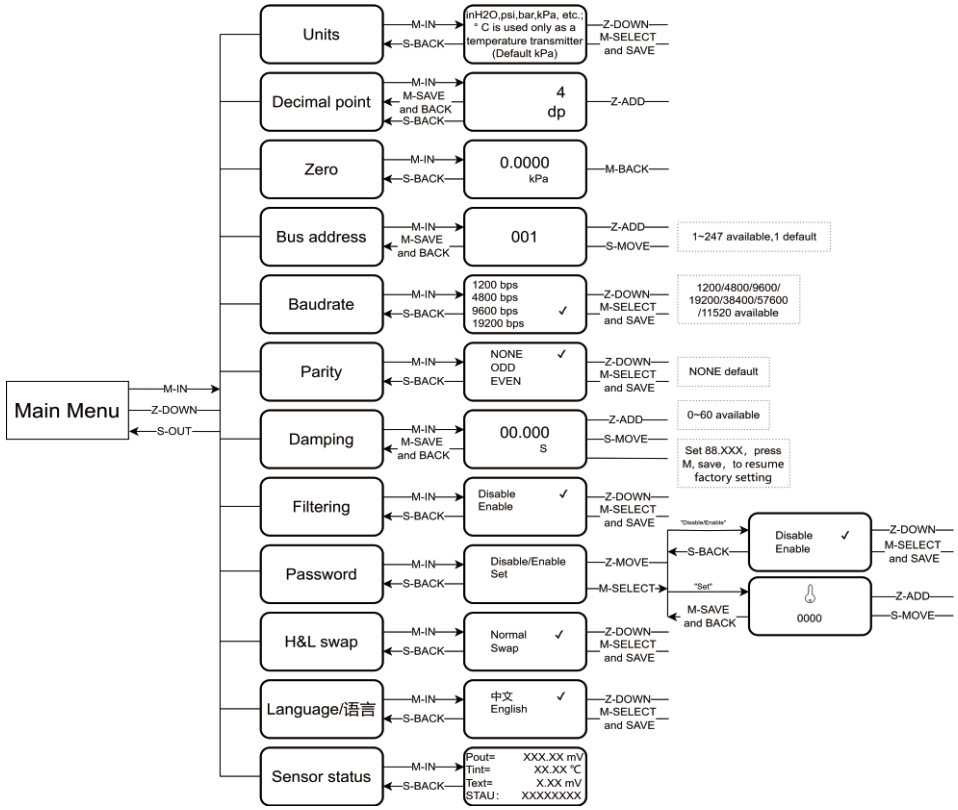
3. Output Characteristics:
Use linear output when measuring differential pressure or liquid level.Use square root output when measuring flow.

4. Pressure Filtering:
This function allows adjustment of the transmitter's filtering intensity to reduce noise interference and eliminate abnormal values.The filtering effect is stronger than that of damping time. It is recommended to enable this function only when damping adjustment alone does not achieve the desired filtering performance.
Default: Off

5. Write Protection:
When enabled, all parameter modifications are locked and cannot be changed.Before performing any parameter adjustments, ensure this function is set to Off.Default: Off

6. High/Low Pressure Side Swap:
If the high- and low-pressure sides are installed incorrectly on-site and it is inconvenient to reinstall, this function allows for logical swapping of the high and low pressure inputs without physical reconnection.

7. Ratio Display:
This function allows for custom unit definition (up to 5 characters) and linear scaling between the upper and lower display limits.For example, if the current range and unit is 0–40 kPa, but the user wants the display to show 0–400 LLL, the custom unit can be set as LLL, with the lower limit set to 0 and the upper limit set to 400 to match the display requirement.



RS485 Menu Structure

Configuration Operation

When configuring the transmitter, make sure the transmitter is powered on and in the measurement display state, press and hold the M button After the main menu interface is displayed for about 5 seconds, release the key to enter the configuration menu interface. Press the S key to return to the main menu, and press the Z key to select a menu item. The key is the confirmation key. When entering the specific parameter setting interface, press the S key to cycle through the parameters that need to be modified. The digits, decimal points and negative signs are included. Press the Z key to modify the selected digit. The digit is +1, and the small tree point is Circular movement, the negative position is positive or negative selection, press M key to save the changes and return to the previous menu.

Example:

Modify Unit

On the main menu page, press the Z key to move the selection up and down, select "Range Units", and short press M Enter; press the Z key to move the selection up and down, select "Unit", and press M to enter; press the Z key to select the unit, and press the M key to confirm the selection. Appear √ means the operation is successful, otherwise please check whether "Write Protect" is "Off"; press S to return to the previous level.

Modify the lower limit

On the main menu page, press the Z key to move the selection up and down, select "Range Units" , and press M to enter; press the Z key to move up and down Move the selection, select "Lower Limit", and press M to enter; press S to select the modification digit, and press Z to modify the number. If the key does not respond, please check whether "Write Protect" is "Off"; press M to save and return to the previous layer.

Restore factory settings

On the main menu page, press the Z key to move the selection up and down, select "Damping Time", short press M to enter; press the S key to select Modify the digit, short press Z key to modify the number, set the number to "88.888 "; press M to save, then the transmitter parameters will be restored Restore to factory settings.

For other operations, see the menu structure.

If no key is pressed for about 90 seconds in the menu or parameter setting state, the transmitter will automatically exit the parameter configuration and return to the default state. Return to measurement state.

4.1 On-Site Installation of LFT710 Differential Pressure Transmitter / LFT700 Pressure Transmitter

4.1.1 Installation Method

The pressure transmitters manufactured by our company can be directly mounted onto a 2-inch pipeline, or alternatively installed on a wall or instrument panel.
(as shown in Figures 4-1 and 4-2)

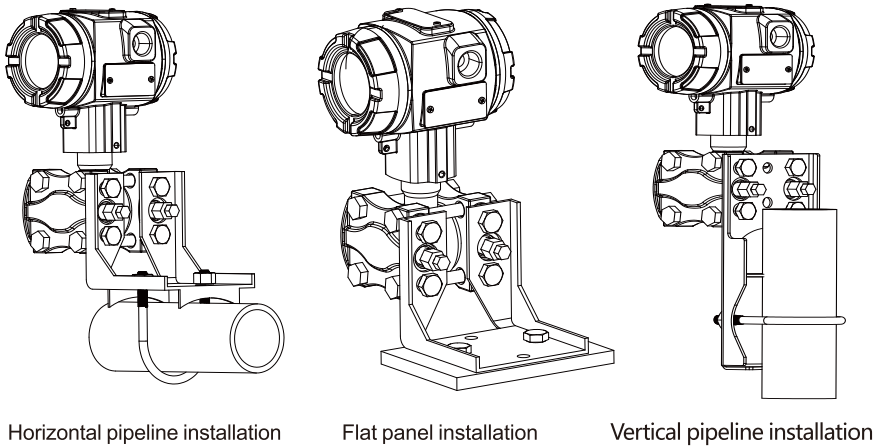


Figure 4-1 LFT710 Differential Pressure Transmitter Installation

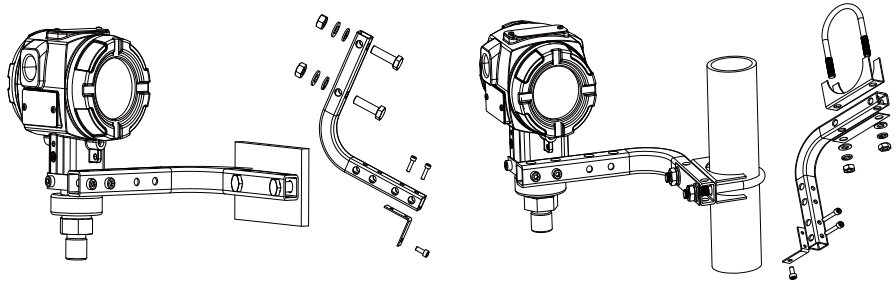
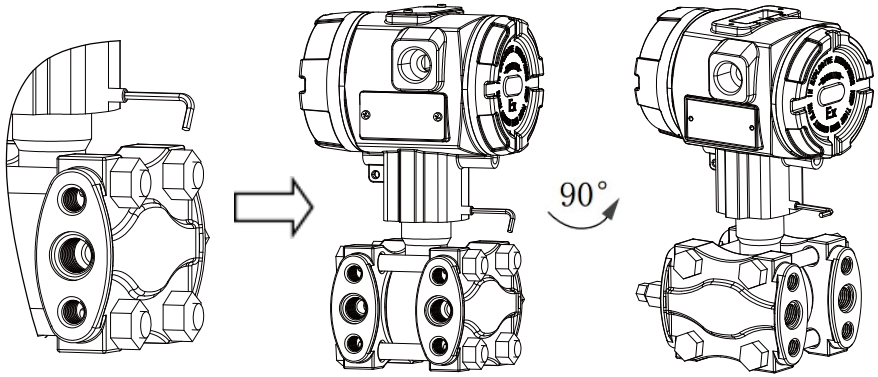


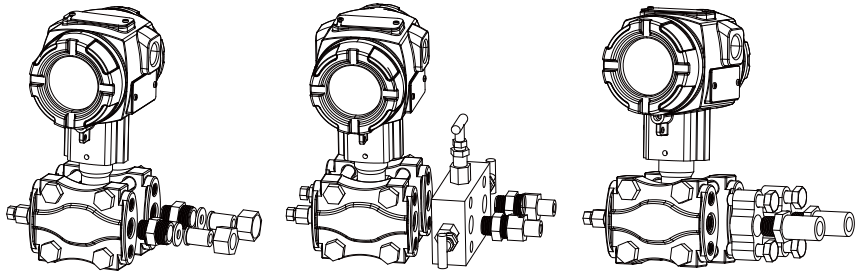
Figure 4-2 LFT 700-Pressure transmitter installation

After loosening the locking screw, the electronic compartment can be rotated 90°, as shown in Figure 4-3.
Warning: Do not rotate more than 90° to avoid breaking the internal cable!



4.1.2 Pressure-inducing method

There are three ways to draw pressure for piezoresistive transmitters, as shown in Figure 4-4:



Welded pipe fitting connection | Integrated three-valve manifold | Oval flange connection

Figure 4-4 Differential pressure transmitter pressure diagram

The pressure lead method of the differential pressure transmitter is mainly threaded connection.Users can configure the lead according to the specific thread specifications. Pressure welded joints.

4.1.3 Adjustment of Process Connection Port Spacing for Differential Pressure Transmitter

The process connection ports on the pressure chamber are 1/4-18 NPT and require threaded sealing.When using an oval flange fitting, the transmitter can be easily removed from the production unit by unscrewing the upper and lower bolts of the fitting. The center-to-center distance between the two process connection ports is 54 mm by default. By rotating the oval flange fitting, the center distance can be adjusted to 50.8 mm, 54 mm, or 57.2 mm.

as shown in Figures 4-5:

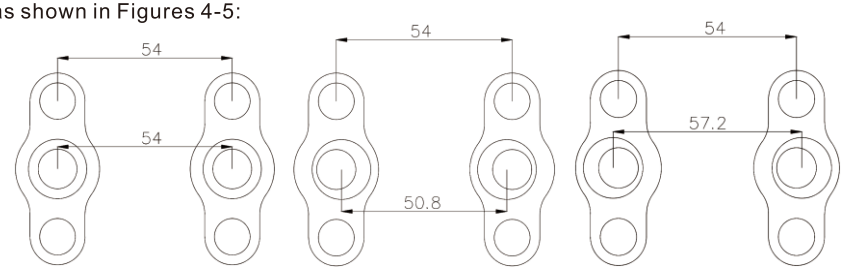


Figure 4-5 Differential pressure transmitter connection hole distance diagram

4.1.4 Installation precautions

1. Prevent the transmitter from contacting with corrosive or high temperature (≥90℃) measured media.
2. Prevent slag from settling in the pressure pipe.
3. The pressure pipe should be as short as possible.
4. The liquid column pressure head in the pressure pipes on both sides of the differential pressure transmitter should be kept balanced.
5. The pressure pipe should be installed in places with small temperature gradient and temperature fluctuation.
6. Prevent crystallization or freezing in the pressure pipe at low temperature.
7. When installing the relief valve, pay attention to check whether the threads are tightened to prevent air leakage.

4.1.5 Issues related to measurement methods

Liquid Measurement:
When measuring liquid flow, the pressure tapping port should be opened on the side of the process pipe to avoid the precipitation of residue. Installed beside or below the pressure tapping port to allow air bubbles to be discharged into the process pipe.

Gas Measurement:
When measuring gas flow, the pressure tapping port should be opened at the top or side of the process pipeline. The transmitter should be installed beside the process pipeline. or above so that the accumulated liquid can flow into the process pipe.

Steam Measurement:
When measuring steam flow, the pressure tapping port should be opened on the side of the process pipe, and the transmitter should be installed below the pressure tapping port. It should be noted that when measuring steam or other high temperature media, the temperature should not exceed Exceeding the operating limit temperature of the transmitter.
When the measured medium is steam, the pressure pipe should be filled with water to prevent the steam from directly contacting the transmitter. During operation, the volume change is very negligible and there is no need to install a condenser.

Liquid level measurement:
The differential pressure transmitter used to measure the liquid level actually measures the static pressure head of the liquid column. This pressure is determined by the height of the liquid and the The pressure is determined by the specific gravity of the body, which is equal to the height of the liquid level above the pressure tap multiplied by the specific gravity of the liquid, and is related to the volume of the container. Or shape doesn't matter.
Liquid level measurement of open containers: When measuring the liquid level of an open container, the transmitter is installed near the bottom of the container to measure its The pressure corresponding to the height of the liquid level above. The pressure of the container liquid level acts on the high-pressure side of the transmitter, while the low-pressure side is If the lowest level of the measured liquid level range is above the transmitter installation location, the transmitter must be properly migrate.
Liquid level measurement in a closed container: In a closed container, the pressure of the container above the liquid is PO Affects the pressure measured at the bottom of the container Therefore, the pressure at the bottom of the container is equal to the liquid level multiplied by the specific gravity of the liquid plus the pressure of the closed container, PO . In order to measure the true liquid level, the pressure of the container should be subtracted from the measured pressure at the bottom of the container. P0. To this end, a pressure tap is opened on the top of the container and connected to the low-pressure side of the transmitter. In this way, the pressure in the container acts on the transmitter at the same time. The resulting differential pressure is proportional to the product of the liquid level and the specific gravity of the liquid.

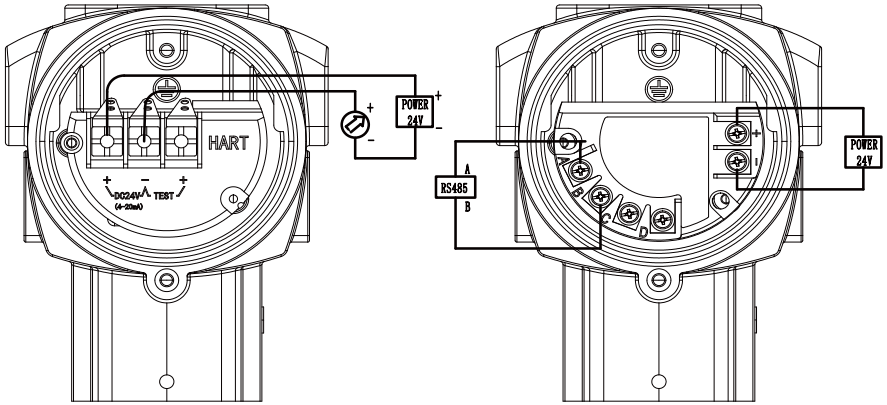
Pressure connection method:
1) Dry pressure connection
If the gas above the liquid does not condense, the connecting pipe on the low pressure side of the transmitter remains dry. This situation is called dry connection. The method for determining the measuring range of the transmitter is the same as the method for measuring the liquid level in an open container.
2) Wet pressure connection
If the gas on the liquid condenses, liquid will gradually accumulate in the pressure pipe on the low-pressure side of the transmitter, causing In order to eliminate this error, a certain liquid is pre-filled into the low-pressure side pressure pipe of the transmitter. This situation is called wet pressure connection.
The above situation causes a pressure head to exist on the low-pressure side of the transmitter, and negative migration must be performed.

Reduce the error:
The pressure pipe connects the transmitter and process pipeline together, and transmits the pressure at the pressure tapping point of the process pipeline to the transmitter.
The following are possible causes of errors in pressure transmission:
1)Leakage;
2)Wear loss (especially when using cleaning agents);
3)There is gas in the liquid pipeline (causing pressure head error);
4)Liquid accumulates in the gas pipeline (causing pressure head error);
5)The density difference between the two pressure pipes due to temperature difference (causing pressure head error)

Ways to reduce errors are as follows:
1) The pressure pipe should be as short as possible;
2) When measuring liquid or steam, the pressure pipe should be connected upward to the process pipeline, and its slope should be less than 1/12;
3) For gas measurement, the pressure pipe should be connected downward to the process pipeline, and its slope should not be less than 1/12;
4) The layout of liquid pressure pipes should avoid high points in the middle, and the layout of gas pressure pipes should avoid low points in the middle. point;
5) The two pressure pipes should maintain the same temperature;
6) To avoid the influence of friction, the diameter of the pressure pipe should be large enough;
7) There should be no gas in the pressure pipe filled with liquid;
8) When using isolation fluid, the liquid in the pressure pipes on both sides must be the same;
9) When using a cleaning agent, the cleaning agent connection should be close to the pressure tapping port of the process pipeline. The length of the pipeline through which the cleaning agent passes should be The length and diameter should be the same, and the cleaning agent should be prevented from passing through the transmitter.

4.2 Electrical Installation

System wiring diagram:



Current Wiring RS485 Catch Wire

Figure 4-6

（Note 1 The user shall configure the distributor or safety barrier according to the site and design requirements, please refer to the distributor for details)

It is recommended to select explosion-proof cable entry terminals with cable diameters of 8 to 12 mm. The terminal is located on one side of the electrical box. In a separate compartment, you can connect the wires by unscrewing the cover. The 485 signal line can be unshielded, but it is better to use shielded twisted wire. Do not lay signal lines together with other power lines, or place them near high-voltage equipment.

The wire holes on the transmitter housing should be sealed or plugged with a sealant plug to prevent moisture from accumulating in the housing. If the wiring is not sealed, the transmitter should be installed with the wire holes facing downward to drain moisture.

Because the transmitter is grounded via capacitive coupling, a high voltage megohmmeter should not be used to check insulation resistance. The voltage of the line should not exceed 100 V.

Hart The current type wiring method is that the positive end of the power supply is connected to the positive terminal on the left; and the negative end of the power supply is connected to the negative terminal on the right side of the box .

As shown in Figure 4-6, the power line is connected to the two terminals on the right, and the 485 signal line is connected to the left. The upper terminal on the right side is positive and needs to be connected to the positive power supply; the lower terminal is negative and needs to be connected to the negative power supply. Terminals, A terminal is connected to the A line of 485 , and B terminal is connected to the B line of 485 .

4.3 Explosion-Proof Transmitter Instructions

When installing the explosion-proof transmitter, attention should be paid to protecting the explosion-proof joint surface and explosion-proof measures. The end cover must be screwed to the bottom and locked . Anti-loosening device; the shell should be grounded; when loading and unloading parts with plane gaps, prevent the plane from colliding or scratching to increase the gap; the shell should be prevented from falling or being damaged to avoid reducing the strength; after the instrument maintenance and inspection, all screws, shells, and joints should be The wire must be fastened and not damaged, otherwise the explosion-proof performance will be lost.

It is strictly forbidden to open or loosen the end cover or shell of the explosion-proof transmitter when the power is on on site.

For explosion-proof transmitters, there are two cable entry ports. One of these ports should be selected for cable wiring, and the cable gland must adopt a special explosion-proof compression nut-type entry device.

A hollow bolt, washer, and sealing rubber ring must be fitted around the cable's outer sheath. The assembly should be inserted into the entry port and tightened. The sealing ring must tightly encase the cable, and the hollow bolt must be screwed in with at least 6 full threads engaged.

The other unused cable entry port must also be fitted with a sealing rubber ring, washer, and a solid bolt, which must be securely fastened and also engaged with at least 6 full threads.To meet explosion-proof requirements, it is recommended to use KVVR-type cable, with specifications of 1.5 mm² × 4-core and an outer diameter of 10 mm (maximum 10.5 mm).

4.4 LFT705- Flange Pressure Transmitter / LFT715 - Single flange differential pressure transmitter / LFT720- Dual Flange differential pressure transmitter installation instructions

4.4.1 Overview

The flange type of Monocrystalline silicon pressure/Differential pressure transmitter is a Monocrystalline silicon pressure /differential pressure transmitter connected to the measured part in the form of a flange. Transmitter, which is used in the following situations:

①It is necessary to isolate the high temperature medium from the Monocrystalline silicon pressure/differential pressure transmitter;

②The measured medium is corrosive to the sensitive element of the Monocrystalline silicon pressure/differential pressure transmitter;

③The measured medium is a suspended liquid or has high viscosity;

④ The measured medium is easy to solidify or crystallize due to changes in ambient temperature or process temperature;

⑤When changing the measured medium, the measuring head must be strictly purified;

⑥The measuring head must be kept clean.

The flange type of Monocrystalline silicon pressure/Differential pressure transmitteris mainly used to continuously and accurately measure liquids, The differential pressure of gas and steam as well as the liquid level, interface, density and other parameters of liquid. Measure the flow rate of gas, liquid and steam, and convert the measured signal into 4~20 mADC Two-wire signal output, To indicate, record and adjust the input signal of the regulator, cooperate with other unit instruments or industrial control computers to form an automatic detection Industrial automation systems such as measurement, recording and control.

4.4.2 Installation location

The flange type of the Monocrystalline silicon pressure/Differential pressure transmitter is directly mounted on the box or tank wall with a flange. When the pressure transmission diaphragm is in a vertical position, the maximum zero point change that can be produced is 28mm H2O.When the diaphragm is in a horizontal position, the zero point change is less than 100mmH2O(For the insert flange , an additional insertion length variation is required), but it has no effect on the measuring range. This error can be corrected . Being eliminated.

4.4.2.1 Remote Transmission Flange Installation Location

When installing the remote transmission flange, the height difference between the Monocrystalline silicon pressure/Differential pressure transmitter and the flange and the Monocrystalline silicon pressure /differential pressure transmitter There are certain restrictions on the height difference between the two flanges of the transmitter. See the table below for the data:

Range No.	Allowable height difference (m)	
	Silicone oil injection	Fluorine oil injection
C	3.84	1.89
D	19.2	9.48
E□F□G	No such restriction	

When the Monocrystalline silicon pressure/Differential pressure transmitter and the flange or the two flanges of the Monocrystalline silicon pressure/Differential pressure transmitter are not at the same height When the instrument is installed, the zero point will change due to the effect of the liquid column in the remote capillary, so it should be readjusted after installation.

4.4.2.2 Changes in the measured medium temperature and the environment will cause the zero point of the Monocrystalline silicon pressure/Differential pressure transmitter to change. Drift can be reduced by installing it in the following way:

1. Do not allow direct sunlight to shine on the Monocrystalline silicon pressure/differential pressure transmitter and remote transmission device;
2. Adjust the zero point according to seasonal changes;
3. Maintain a constant temperature of the remote capillary.

4.4.3 Instrument adjustment

The adjustment of the flange type Monocrystalline silicon pressure/Differential pressure transmitter is the same as that of the general Monocrystalline silicon pressure/Differential pressure transmitter in principle. It only needs a device to seal the flange and give the test standard pressure.