

## Instructions

# Intelligent Transmitter

HI3151D / HL3151T / HL3151LT



**attestation**

**ISO 9001:2015**

Please read this instruction manual carefully before installation



## | Summary

The measurement element adopts the world's leading high-precision silicon sensor technology,  $\pm 0.075\%$  accuracy, signal output 4-20 mA, and superposition HART. The communication protocol is suitable for the measurement of pressure, differential pressure and liquid level in large and medium-sized equipment and production process control

The density of the static liquid can be measured together with the original measurement unit. The volume or mass of the liquid can be measured together with the original measurement unit. With the original measurement matching to measure the flow of gas, steam and liquid



## | Product characteristics

- **Pressure / differential pressure sensor using high-precision silicon sensor technology**

The whole temperature zone 15-point automatic pipeline calibration is linear, and the temperature influence is small

The range migration ratio can reach 100:1

Good long-term stability

- **Electronic modular design**

Working configuration, integrated LCD display and HART communication remote transmission. All parameters can be modified by the header key configuration.

Functional monitoring and remote data reading of sensors and electronic modules to ensure the stability of use.

- **Process connection is flexible and optional**

Working configuration, integrated LCD display and HART communication remote transmission. All parameters can be modified by the header key configuration.

Functional monitoring and remote data reading of sensors and electronic modules to ensure the stability of use.

- **Integrated calibration and temperature supplement**

The factory accuracy of the products is better than 0.075%

The measurement accuracy of the product is of grade 0.1%, except for the pressure / differential pressure transmitter with the remote transmission device. The measurement accuracy is evaluated separately according to the actual needs.

## Technical parameters

### Supply voltage

General purpose: DC 10.5 ~45V

Primary safety explosion - proof: DC 10.5 ~ 26V ± 0.005% / 1V

### Power impact

DC 4 - 20mA + HART protocol

### Output signal

0-600 Ω (when DC24V) Note: A load resistance of standard 250 ohms is required for communication with the HART manipulator

### Permissible load

The longest connection cable is 2KM (0.75~1.25 square RVVP cable for control instrument, twisted pair cable over 1km)

### Communication cable

Note: load resistance 250~600 Ω, including cable resistance, at DC24 working voltage

Note: load capacitance below 0.55 mF

Note: load inductance below 3.3 mH

Note: with the price of the power line is 15cm, please avoid parallel wiring

### EMC suit

EN 1326- 1:2006

### Weather fastness

DIN 40040GPC

### Response time

90ms

### damping period

The time constant can be adjusted within another 0 ~99.9S

### Filter constan

It can be adjusted within 0- 160 uA

### Autostability coefficient

Can be adjusted within 0-2%

### Medium temperature

-40 ~85°C

### Ambient temperature

Regular products at-40 ~85°C, - 10 ~60°C

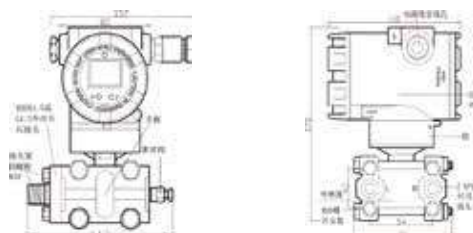
### Storage temperature

Conventional products are available at-40 to 90°C

### Appearance size



HL 3151T Series of directly mounted intelligent pressure / absolute pressure transmitter appearance size diagram



Appearance and dimension diagram of HL 3151D series intelligent pressure / differential pressure transmitter

## HL 3151D Series intelligent pressure / differential pressure transmitter

- Output characteristics: 4 ~ 20 mA ADC current output, Superimpose the HART communication protocol, Precision, 0.075% level, P 6 KPa full range
- Liquid membrane material: conventional 316L stainless steel, Optional ordering of tantalum, Ha C
- Main use: differential pressure measurement of medium, The accompanying measuring element provides for the density of the measuring medium, volume, mass and flow
- Process connection: M20 \* 1.5 external thread, 1 / 4 NPT-18 splthread, 1 / 2 NPT-14 internal thread, G1 / 2 external thread
- Additional introduction: can be matched with two valve group, three valve group and domestic five valve group, Splint mounting thread M10



### Product Types Choosing

Model	Transmitter type	
HL 3151D	Monocrystalline silicon intelligent transmitter	

Type of measurement	Type of pressure measurement	
R	Micro differential pressure	Intelligent micro differential pressure transmitter
P	Differential pressure	Intelligent differential pressure transmitter
G	High pressure	Intelligent pressure transmitter
H	Static pressure	Intelligent high-static pressure differential pressure transmitter

HL 3151DR Micro differential pressure (suitable for monocrystalline silicon intelligent micro differential pressure transmitter with pressure measurement type selected "R")

Quota	Measuri	Reference accuracy	Unilater	Bilateral
1	-100...0 ~100Pa	0.30%	1MPa	10MPa
2	-500...0 ~500Pa	0.20%	1MPa	10MPa
3	-1KPa...0 ~1KPa	0.10%	2MPa	10MPa

HL 3151DP Differential pressure (suitable for monocrystalline silicon intelligent differential pressure transmitter with pressure measurement type selected "P")

Quota	Measuri	Reference accuracy	Unilater	Bilateral
1	-6...0 ~6KPa	0.075%	3MPa	25MPa
2	-40...0 ~40KPa	0.075%	5MPa	25MPa
3	-400...0 ~400KPa	0.075%	10MPa	25MPa
4	-4MPa ...0 ~4MPa	0.075%	10MPa	25MPa

HL 3151DG Pressure (suitable for monocrystalline silicon intelligent pressure transmitter with pressure measurement type selected "G")

Quota	Measuri	Reference accuracy	Unilater
1	-6...0 ~6KPa	0.075%	3MPa
2	-40...0 ~40KPa	0.075%	5MPa
3	-400...0 ~400KPa	0.075%	10MPa
4	-4MPa ...0 ~4MPa	0.075%	10MPa

# Intelligent Transmitter

HL3151DH High static pressure (suitable for monocrystalline silicon intelligent high static pressure differential voltage transmitter with pressure measuring type selected "H")

Quota	Measuri	Reference accuracy	Unilater	Bilateral
1	-6...0 ~6KPa	0.075%	16MPa	40MPa
2	-40...0 ~40KPa	0.075%	16MPa	40MPa
3	-400...0 ~400KPa	0.075%	16MPa	40MPa
4	-4MPa ...0 ~4MPa	0.075%	16MPa	40MPa

## Transmitter output

4 ~20mA Digital signal with HART protocol

Component material	Pressure / differential volume chamber structure	Block	Material of relief valve
1	1 / 4 NPT on the chamber flange,internal thread,drain valve in the back	316 Stainless steel	316 Stainless steel
2	1 / 4 NPT on the chamber flange,internal thread,drain valve in the back	304 Stainless steel	304 Stainless steel
3	1 / 4 NPT,internal thread,drain valve on the side	316 Stainless steel	316 Stainless steel
4	1 / 4 NPT,internal thread,drain valve on the side	304 Stainless steel	304 Stainless steel

Isolation diaphragm	diaphragm material
2	316LSST
3	Hartz alloy C
4	Monel alloy
5	Tantalum

O-ring material	sensor sealing ring material
A	Fluorinerubber
B	GlasswasfilledwiththePTFE
C	Graphite-filledPTFE

Sensor filling oil	Seal into the liquid	The measure
1	Silicone oil	Routine
2	Silicone oil	Degrease cleaning treatment
3	Fluorine oil	Routine
4	Fluorine oil	Degrease cleaning treatment

Housing / Electrical Connection	Housing material	Electrical interface dimensions
A1	Aluminum, with glazed windows	1/2-14 NPT internal thread, complete with nylon blind blocking and lock wire connector
A2	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking
A3	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint

Housing / Electrical Connection	Housing material	Electrical interface dimensions
B1	Aluminum, with glazed windows	M 20 * 1.5 internal thread, matched with nylon blind blocking and lock wire joint
B2	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking
B3	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint

Process connection	Selection items
5	1/2NPT female process connection
6	1/2NPT inner wire with 1/2NPT outer wire to M20*1.5 outer wire conversion head with M20*1.5 inner wire to $\phi$ 14 stainless steel movable welding base
7	M20*1.5 male thread process connection
8	M 20 * 1.5 outer wire with M 20 * 1.5 inner wire turn $\phi$ 14 stainless steel movable welding base
9	Splint thread 1 / 4 NPT internal wire without process connection

Attachment options	Select items
B1	2 inch tube L-bend bracket
B2	Flat right-angle bend bracket
B3	2 inch tube mounted flat plate stand
F2	Two valve groups
F3	Three valve groups
F5	Five valve groups
Z1	Welded needle valve
Ed	Flameproof Exd II CT6
Ei	Intrinsically safe Exia II CT6 (without barrier)

## HL 3151T Series direct mounted intelligent pressure / voltage transmitter

- Range: 0-100Pa 0MPa...4
- Measurement accuracy : 0.075% level, P 40 KPa full range
- Liquid diaphragm material : conventional 316L stainless steel, optional tantalum, Ha C, Monel and spray ing tetrafluoride process
- Main use: pressure measurement of pipeline medium
- Process connection: M 20 \* 1.5 external thread, 1 / 2 NPT-14 internal thread, G 1 / 2 external thread, can be converted to other forms of process connection
- Additional introduction: It can be paired with a two valve manifold, needle valve, and heat dissipation device



### Product Types Choosing

Model	Transmitter type
HL 3151T	Monocrystalline silicon, directly mounted intelligent transmitter

Type of measurement	Type of pressure measurement	
G	Pressure / negative pressure	Intelligent pressure transmitter
A	Absolute pressure	Intelligent absolute voltage relief transmitter

HL 3151TG Direct mounted pressure (suitable for monocrystalline silicon direct mounted intelligent pressure transmitter with pressure measurement type selected "G")

Quota	Measuri	Reference accuracy	Unilater
1	-10...0~10KPa	0.075%	3MPa
2	-40...0~40KPa	0.075%	5MPa
3	-100...0~400KPa	0.075%	10MPa
4	-0.1...0~4MPa	0.075%	10MPa
5	-0.1...0~10MPa	0.075%	10MPa
6	-0.1...0~40MPa	0.075%	60MPa

HL3151TA direct mounted pressure transmitter (suitable for single crystal silicon direct mounted intelligent pressure transmitter with pressure measurement type "A")

Quota	Measuri	Reference accuracy	Unilater
1	0~10KPa	0.075%	3MPa
2	0~40KPa	0.075%	5MPa
3	0~400KPa	0.075%	10MPa
4	0~4MPa	0.075%	10MPa

Transmitter output	
A	4 ~20mA with digital signal of HART protocol, LCD display

Isolation diaphragm	diaphragm material	Material of induced
2	316LSST	304 stainless steel
3	Hartz alloy C	316 stainless steel

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Isolation diaphragm	diaphragm material	Material of induced
4	Monel alloy	316 stainless steel
5	Tantalum	316 stainless steel

O-ring material	sensor sealing ring material
A	Fluorine rubber
B	Glass was filled with the PTFE
C	Graphite-filled PTFE

Sensor filling oil	Seal into the liquid	The measure
2	Silicone oil	Routine
3	Silicone oil	Degrease cleaning treatment
4	Fluorine oil	Routine
5	Fluorine oil	Degrease cleaning treatment

Housing / Electrical Connection	Housing material	Electrical interface dimensions
A1	Aluminum, with glazed windows	1/2-14 NPT internal thread, complete with nylon blind blocking and lock wire connector
A2	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking
A3	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint
B1	Aluminum, with glazed windows	M 20 * 1.5 internal thread, matched with nylon blind blocking and lock wire joint
B2	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking
B3	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint

Process connection	Selection items
5	1/2NPT female process connection
6	1/2NPT inner wire with 1/2NPT outer wire to M20*1.5 outer wire conversion head with M20*1.5 inner wire to $\phi$ 14 stainless steel movable welding base
7	M20*1.5 male thread process connection
8	M 20 * 1.5 outer wire with M 20 * 1.5 inner wire turn $\phi$ 14 stainless steel movable welding base
9	G 1/2 external thread process connection (4 extra)

Attachment options	Select items
B1	2 inch tube L-bend bracket
F2	Two valve groups
Z1	Welded needle valve
Ed	Flameproof Exd II CT6
Ei	Intrinsically safe Exia II CT6 (without barrier)



## HL 3151LT Series of intelligent differential pressure / liquid level transmitter

The differential pressure transmitter with single flange diaphragm seal is mainly used for the continuous measurement sheet of liquid level in the process industry

Flange diaphragm seal, or double flange seal, low pressure side strap capillary

- Range: 0-6 KPa... 10MPa, and corresponding conversion level
- Measurement accuracy : 0.075% level, P 40 KPa full range
- Liquid diaphragm material : conventional 316L stainless steel, optional tantalum, Ha C, Monel and spraying tetrafluoride process
- Main use: pressure measurement of pipeline medium and liquid level measurement of atmospheric pressure tank body
- Process connection: regular HG20592 standard, American standard and Japanese standard can be customized
- Additional introduction: it can be matched with the 316 material flushing ring



### Product Types Choosing

Model	Transmitter type
HL 3151LT	Monocrystalline silicon intelligent differential pressure / liquid level transmitter

Quota	Measuri	Reference accuracy	Unilater	Bilateral
1	-6...0~6KPa	0.075%	3MPa	25MPa
2	-40...0~40KPa	0.075%	5MPa	25MPa
3	-100...0~400KPa	0.075%	10MPa	25MPa
4	-0.1...0~4MPa	0.075%	10MPa	25MPa
5	-0.1...0~10MPa	0.075%	10MPa	25MPa

Transmitter output	
A	4 ~20mA with digital signal of HART protocol, LCD LCD display

High-pressure side flange parameters-Flange material	
A	SUS 304 Stainless steel
B	SUS 316 Stainless steel

High-pressure side flange parameters- flange specification		U. S. standard size
1	HG/T 20592 Dn15	
2	HG/T 20592 Dn20	
3	HG/T 20592 Dn25	
4	HG/T 20592 Dn40	
5	HG/T 20592 Dn50	2inch
6	HG/T 20592 Dn65	
7	HG/T 20592 Dn80	3inch
8	HG/T 20592 Dn100	4inch
9	Other flange specifications and sizes, such as 9 (DN32) representing DN32	

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High-pressure side flange parameters- sealing surface		Resistant pressure
1	PN10/16	1.6MPa
2	PN25/40	4.0MPa
3	PN64	6.4MPa
4	PN100	10MPa
5	ANSI 150 (same as HG and GB American systems)	2.0MPa
6	ANSI 300 (same as HG and GB American systems)	5.0MPa
7	ANSI 600 (same as HG and GB American systems)	11MPa

High-pressure side flange parameters-sealing surface		Resistant pressure
M0	M-face convex seal without extension	
R0	RF face seal without extension	
R1	RF face seal with insertion cartridge 50mm	316 stainless steel
R2	RF face seal with insertion cartridge 100mm	316 stainless steel
R3	RF face seal with insertion tube 150mm	316 stainless steel
R4	RF face seal with insertion tube 200mm	316 stainless steel

High-pressure side flange parameters-diaphragm material	
S	And 316L of stainless steel
C	hastelloy C
M	Monnell film
T	Tantalum film
F	316L stainless steel, tetrafluorinated diaphragm surface
H	C, diaphragm surface spray tetrafluorotantalum
N	Membrane sheet, spray tetrafluoride on the diaphragm surface
K	316L stainless steel, gold-plated diaphragm surface

High-pressure side flange parameters-capillary length	The capillary material	Armor sheath material
0	0 meters, without capillary. (Connect the high-pressure side flange to the transmitter body)	316 stainless steel 304 armor+PVC sheath
X	"X" is a specific number that represents the corresponding number of meters (in meters)	316 stainless steel 304 armor+PVC sheath

Flange filling oil	Seal into the liquid	Applicable temperature range
D	Silicone oil DC200	-40~205°C
Z	Vegetable oil	-10~90°C
F	Fluoro oil	-50~150°C
D	Inert oil (haloalkane) high	-45~177°C
G	Warm silicone oil DC704	15~315°C(capillary≤5m)

Low voltage side	Process Connection	Installation screw size
0	Low pressure side blind plate, no process connection required, with ventilation holes left in the clamp plate	M10
1	1/4NPT clamp plate internal thread	M10
2	1/2NPT internal thread	M10
3	M20 * 1.5 external thread	M10

Housing / Electrical Connection	Housing material	Electrical interface dimensions
A1	Aluminum, with glazed windows	1/2-14 NPT internal thread, complete with nylon blind blocking and lock wire connector
A2	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking
A3	Aluminum, with glazed windows	1/2-14 NPT internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint
B1	Aluminum, with glazed windows	M 20 * 1.5 internal thread, matched with nylon blind blocking and lock wire joint
B2	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking
B3	Aluminum, with glazed windows	M 20 * 1.5 internal thread, equipped with 304 stainless steel blind blocking and lock line explosion-proof joint

Attachment options	Select items
C1	304 stainless steel flushing ring (refer to flange specifications and pressure rating selection for specifications)
C2	316 stainless steel flushing ring (refer to flange specifications and pressure rating selection for specifications)
B3	2-inch tube mounted flat bracket
Ed	Flameproof Exd II CT6
Ei	Intrinsically safe Exia II CT6 (without barrier)