

General Introduction

HH Series Capacitance Type Transmitter

FEATURES

- High accuracy
- No mechanical and movable parts, little repair work
- Span and zero continuous and adjustable from outside
- Good stability
- Positive shift amount to 500%; negative shift 600%
- Two-wire system 4~20mA DC
- Damping adjustable, overpressure protection
- Solid components, patch-type printed circuit board
- Explosion-proof structure, all-day use
- Unified structure, strong interchangeability of parts
- Miniaturization (total height 166mm)
- Diaphragm materials of contacting mediums option (316L, TAN, HAS-C, MONEL, etc.)
- smart HART protocol

FUNCTION PARAMETERS

- ▲ Service: liquid, gas and steam
- ▲ Measuring range : 0~0.06 kPa to 0~40Mpa
- ▲ Output signal : 4~20mA DC (four-wire 220V AC power supply, 0~10mA DC output for special)
- ▲ Power supply : 12~45V DC, generally 24V DC
- ▲ Features of loading: relation equation of loading impedance RL and power voltage
 $V_s: RL \leq 50(V_s - 12)$
- ▲ Indicator : pointer-type linearity indication 0~100% scale mark or LCD indicator, LED indicator.
- ▲ Explosion proof : a. explosion isolation d II CT6
b. intrinsically safe ia II CT6
- ▲ Positive and negative shifts : after positive and negative shifts of zero absolute values of upper-and-lower-limit values of span and measuring range not exceed 100% of upper limit of measuring range.(smart type : turn down ratio 20:1, 40:1)
Maximum positive shift is 500% of minimum adjusting span; maximum negative shift is 600% of minimum adjusting span.
- ▲ Temperature range: amplifier operation temperature range: -29 ~ +93C
(LT type: -25 ~ +70C); measuring component of fill silicone oil: -40 ~ +104C
flange type transmitter fill hi-temperature silicone oil: -20 ~ +315C normal silicone oil: -40 ~ +149C

- ▲ Static pressure : 4, 10, 25, 32Mpa
- ▲ Humidity : relative humidity 0~100%
- ▲ Volume absorption : < 0.16cm³
- ▲ Damping (phase step response) : For silicone oil, generally between 0.2s and 1.67s, continuous and adjustable

TECHNICAL DATAS

(no shift, under standard operation conditions, fill silicone oil, 316 SS diaphragm)

1. Accuracy class: +/-0.25%, +/-0.5% (smart type: +/-0.1%, +/-0.075%)
2. Dead zone: no (<=0.1%)
3. Stability : within 6 months not beyond absolute value of basic error of maximum span
4. Vibration effect: on a random ax upward, at vibration frequency of 200 Hz, error +/-5%/g of upper limit of measuring range.
5. Power effect : < 0.005%/V of output span
6. Loading effect : no effect from loading at stable power
7. Effect of installation position : at most 0.24kPa of zero error, no effect on span

OTHERS

1. Diaphragm: 316 SS, HC -276, Monel or Ta
2. Exhaust/vent Valve: 316 SS, HC or Monel
3. Flange and Connector: 316 SS, HC or Monel
4. Contacting medium "O" ring: acrylonitrile-butadiene rubber, fluorine rubber
5. Fill liquid: silicone oil or inert oil
6. Blot: 316 SS
7. Electronic Body Material: low copper-aluminum alloy
8. Ignition Voltage Connection Fit : flange NPT 1/4, center distance 54mm; connector NPT 1/2 or M20 x1.5 male round-cone surface sealed, when carrying connector the center distance 50.8, 54, 57.2mm (NPT taper thread accords with GB/T12716-91)
9. Signal line connecting hole : G 1/2"
10. Weight :4.2 kg (standard type)

TRANSMITTER SELECTION

The following sheet illustrates the model constitution of our products in detail. Users can easily select product models according to this sheet.

Code	Name	
HH	Huahai M & C	
	Code	Directions
	0	Subatmospheric pressure
	1	Gauge pressure (differential pressure and static pressure is 0.4 Mpa for span formula 1,2)
	2	Absolute pressure

3	Differential pressure	static pressure 2.5 MPa
4	Differential pressure	static pressure 4MPa
5	Differential pressure	static pressure 6.4MPa
6	Differential pressure	static pressure 16 MPa
7	Differential pressure	static pressure 25MPa
8	Differential pressure	static pressure 32 MPa
9	Differential pressure	static pressure 40MPa
Code Measuring range		
1	0-0.06~0.3kPa	
2	0-0.25~1.5kPa	
3	0-1.2~7.2kPa	
4	0-6~36kPa	
5	0-30~180kPa	
6	0-160~1000kPa	
7	0-400~2500kPa	
8	0-1600~10000kPa	
9	0-4000~25000kPa	
0	0-7000~40000kPa	
Code Type1		
0	Standard type	
1	Single flush flange	
2	Double flush flange	
3	Single insertion flange	
4	Double insertion flange	
5	One-flush & one-insertion flange	
Code Type 2		
0	Popularization type	
1	Normal smart type (HART communication)	

ACCESSORY AND MATERIAL CODES

Code	Implication
M1	Pointer-type linearity indication 0-100% scale
M2	Digital indicator
E1	Ordinary cable connector
E2	Flame proof cable connector
B1	Bent bracket for pipe mounting
B2	Bent bracket for plate mounting
B3	Flat bracket for pipe mounting
G1	Waist-shaped flange
G2	Welding pipe adapter

G3	Integral 2-valve manifold			
G4	Integral 3-valve manifold			
G5	Integral 5-valve manifold			
i	Intrinsically safe			
d	Explosion isolation			
G	≤ 200 °C (silicon oil with high temperature)			
Standard Type	Structure material			
	Erosion proof material	Flange connector	Drain/vent valve	Isolation diaphragm
	F12	Carbon steel	316 L	316 L
	F13	Carbon steel	Hastelloy C	Hastelloy C
	F14	Carbon steel	Monel	Monel
	F15	Carbon steel	316 L	Titanium
	F22	316 L	316 L	316 L
	F23	316 L	316 L	Hastelloy C
	F24	316 L	316 L	Monel
	F25	316 L	316 L	Titanium
	F26	316 L	316 L	Hastelloy B
	F33	Hastelloy C	Hastelloy C	Hastelloy C
	F35	Hastelloy C	Hastelloy C	Titanium
	F44	Monel	Monel	Monel
	F47	Monel	Monel	3YC25

Remarks: ①F22 is standard equipment ②linearity, evolution output is controlled by software, optional for user.

HHDP Type

Smart Differential Pressure Transmitter

Using differential capacitance as detecting principle to constitute capacitance type differential pressure transmitter, inputting pressure is 0~1.2kPa to 0~10MPa, etc. Service medium: liquid, gas and vapor. Overpressure limit: impose 0 (absolute pressure) ~6MPa pressure on either side of the transmitter. The transmitter is not damaged. The transmitter's operation static pressure is detailed in the models and specifications sheet.



MODEL SELECTION

A	S	Code	Measuring range	Operation pressure(MPa)		
Analogue	Smart	HHDP-3300	0-1.2~7.2kPa	2.5		
		HHDP-5300	0-1.2~7.2kPa	6.4		
		HHDP-5400	0-6~36kPa	6.4		
		HHDP-5500	0-30~180kPa	6.4		
		HHDP-6400	0-6~36kPa	16		
		HHDP-6500	0-30~180kPa	16		
		HHDP-9600	0-160~1000kPa	40		
		HHDP-9700	0-400~2500kPa	40		
		HHDP-8800	0-1600~10000kPa	32		
				Code	Structure material	
			Flange connector	Exhaust/vent valve	Isolation Diaphragm	Fill Liquid
		F12	Cadmium plated CS	316L SS	316L SS	Silicone oil
		F13	Cadmium plated CS	Hastelloy C	Hastelloy C	
		F14	Cadmium plated CS	Monel	Monel	

F15	Cadmium plated CS	316L SS	Tantalum
F22	316L SS	316L SS	316L SS
F23	316L SS	316L SS	Hastelloy C
F24	316L SS	316L SS	Monel
F25	316L SS	316L SS	Tantalum
F33	Hastelloy C	Hastelloy C	Hastelloy C
F35	Hastelloy C	Hastelloy C	Tantalum
F44	Monel	Monel	Monel

Code	Optional components
M1	Linearity indicator 0-100% scale mark
M2	LCD Display
B1	Bend bracket for pipe mounting (2" pipe)
B2	Bend bracket for plate mounting
B3	Flat bracket for pipe mounting (2" pipe)
D1	Side exhaust/vent valve of flange on top
D2	Side exhaust/vent valve of flange on bottom
E1	Ordinary cable connector
E2	Flame-proof cable connector
G1	Waist type flange
G2	Welding pipe connector
G3	Integral 2-valve manifold
G4	Integral 3-valve manifold
G5	Integral 5-valve manifold
d	Explosion separation type Exd II CT6
i	Intrinsically safe Exib II CT5

S	HHDP-3300	F22	M2B1D1E1G2i	6kPa (factory span)
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Remarks: ① Factory span should be specified at ordering, if not specify, at the highest rated span output, structure material F22 is standard equipment.

② Process connection and electrical connection to be specified by the customer.

HHDR Type

Smart Low Differential Pressure Transmitter

Using differential capacitance as detecting principle to constitute low differential pressure capacitance type transmitter, inputting 0-0.06~1.5kPa pressure, outputting 4-20 mA DC analogue signal.

Service medium: liquid, gas and vapor.

Overpressure limit: impose 0~6MPa (absolute pressure) pressure on either side of transmitter. Transmitter is not damaged. Flange can afford 60Mpa of pressure.



MODEL SELECTION

A	S	Code	Measuring range	Working pressure (MPa)		
Analogue	Smart	HHDR-1100	0-0.06~0.3kPa	0.4		
		HHDR-1200	0-0.25~1.5kPa	0.4		
		HHDR-3200	0-0.25~1.5kPa	2.5		
		Code	Structure material			
			Flange connector	Exhaust/vent valve	Isolation Diaphragm	Fill Liquid
		F12	CS Cd-plating	316L SS	316L SS	Silicone oil
		F13	CSS Cd-plating	Hastelloy C	Hastelloy C	
		F14	CS Cd-plating	Monel	Monel	
		F15	CS Cd-plating	316L SS	Tantalum	
		F22	316L SS	316L SS	316L SS	
		F23	316L SS	316L SS	HC	
		F24	316LSS	316L SS	Monel	
		F25	316L SS	316L SS	Tantalum	
		F33	Hastelloy C	Hastelloy C	Hastelloy C	
		F35	Hastelloy C	Hastelloy C	Tantalum	
		F44	Monel	Monel	Monel	

Code	Optional components
M1	Linearity indicator 0-100% scale mark
M2	LCD Display
B1	Bend bracket for pipe mounting (2" pipe)
B2	Bend bracket for plate mounting
B3	Flat bracket for pipe mounting (2" pipe)
D1	Profile exhaust/vent valve of flange on top
D2	Profile exhaust/vent valve of flange on bottom
E1	Ordinary connector
E2	Flame-proof cable connector
G1	Waist type flange
G2	Welding pipe connector
G3	Integral 2-valve manifold
G4	Integral 3-valve manifold
G5	Integral 5-valve manifold
d	Explosion separation type Exd II CT6
i	Intrinsically safe Exib II CT5

S	HHDR-3200	F22	M2B1D1E1G2i	0.3kPa(factory span)
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Remarks: ① Factory span should be specified at ordering, if not specify, at the highest rated span output, structure material F22 is standard equipment.

② Process connection and electrical connection to be specified by the customer.

HHHP Type

Smart High Static Differential Pressure Transmitter

HHHP type (smart) high static pressure differential pressure transmitter can measure differential pressure under operation pressure of 32MPa. 32MPa proof operation pressure and overloading protection ensure the transmitter to get reliable application in hi-static pressure system.



MODEL SELECTION

A	S	Code	Measuring Range	Operation Pressure (MPa)		
Analogue	Smart	HHHP-7400	0-6~36kPa	25		
		HHHP-8400	0-6~36kPa	32		
		HHHP-9400	0-6~36kPa	40		
		HHHP7500	0-6~36kPa	25		
		HHHP-8500	0-30~180kPa	32		
		HHHP-9500	0-30~180kPa	40		
		Structural Material				
		Code	Flange Adapter	Exhaust/vent Valve	Isolation Diaphragm	Liquid fill
		F12	CS Plating Cadmium	316LSS	316LSS	Silicone oil
		F13	CS Plating Cadmium	Hastelloy C	Hastelloy C	
		F14	CS Plating Cadmium	Monel	Monel	
		F15	CS Plating Cadmium	316LSS	Tantalum	
		F22	316L SS	316LSS	316LSS	
		F23	316L SS	316L SS	Hastelloy C	
		F24	316L SS	316L SS	Monel	
		F25	316L SS	316L SS	Tantalum	
		F33	Hastelloy C	Hastelloy C	Hastelloy C	

F35	Hastelloy C	Hastelloy C	Tantalum	
F44	Monel	Monel	Monel	
	Code	Optional components		
	M1	Linear indicator 0-100% scale mark		
	M2	Digital indicator		
	B1	Bend bracket for pipe mounting (2" pipe)		
	B2	Bend bracket for plate mounting		
	B3	Flat bracket for pipe mounting (2" pipe)		
	D1	Side exhaust/vent valve of flange on top		
	D2	Side exhaust/vent valve of flange on bottom		
	E1	Ordinary cable connector		
	E2	Flame-proof cable connector		
	G1	Waist type flange		
	G2	Welding pipe connector		
	G3	Integral 2-valve manifold		
	G4	Integral 3-valve manifold		
	G5	Integral 5-valve manifold		
	d	Explosion separation type Exd II CT6		
	i	Intrinsically safe Exib II CT5		



S	HHDR-3200	F22	M2B1D1E1G2i	0.3kPa(factory span)
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Remarks: Factory span should be specified when ordering, if not specify, at the highest rated span output, structure material F22 is standard equipment.