Intelligent Differential Pressure Transmitter

Product Overview

Intelligent differential pressure transmitter is a new type of instrument researched and developed by our company according to international advanced tech-nology combined with many domestic technologies. This instrument adopts micro-processing technology for temperature characteristic and non-linear compensation, thus having greatly enhanced the measurement accuracy of the instrument, improved the temperature characteristic and expanded the turndown ratio. Besides, intelligent functions can be added, which further meets the requirements of high reliability and high stability of the instrument at the industrial sites. The adoption of digital technology in the capacitive pressure / differential pressure transducer not only ensures high reliability of the instrument and other superior performance, but also realizes the remote digital connection between the intelligent instrument and the control room to ensure rapid and reliable communica-tion. The control room can remotely enquire into or make a real–time configuration of the transducer.

Working Principle

The intelligent PCB integrates converting circuit and processing circuit into one circuit using advanced IC and SMT technology. The micro-processor of the transducer controls the A / D and D / A converting module and performs digital communication and self-diagnosis function. When working, the micro-processor controls the A / D converting module for sampling conversion of the analog signals from the sensitive elements and converts them into digital signal so that the micro-processor can process it, including signal linearization, temperature compensation, engineering unit conversion etc. The micro-processor can also complete sensor characterization, measuring range, damping time, and other functions. E2PROM stores all the configurations and tuning parameters. Because the memory is a non-volatile memory (NVM), the parameters stored will not be lost in case of power failure. The PC working station or personal digital assistant (PDA) is used to configure and test the parameters or complete communication with any upper system supporting HART protocol. HART protocol uses industrial standard BELL202 frequency shift keying (FSK) technology to realize communication with the 1200HZ2200HZ digital signals overlapped on 4 ~ 20mA signal. The frequency signal during communication will not disturb the process signal. This intelligent capacitive transducer can perform online real-time self-diagnosis. The transducer has a presetting value of 3.9mA before delivery if it has 21mA or 3.9mA output.

Product Features

- High accuracy
- Good stability
- Small size, light weight, solid and vibration resistant
- Good compatibility, compatible with products of other companies in line with HART protocol
- Support the user to use handheld unit 272 / 275 or PC for software debugging and for real-time configuration of the instrument during its running.
- Can conduct intelligent linearization for pressure signal to ensure higher accuracy of measurement.

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Functional Indicators

Measured medium	Liquid, gas, or vapor
Power supply	12-----45V, 24V DC generally
Indicating gauge	LCD gauge
Explosion-proof	a. Flameproof type d Ⅱ BT4，b. Intrinsically safe type ia Ⅱ CT6
Measuring range & zero point	Externally and continuously adjustable
Positive and negative immigration	The lower and upper limit of the measuring range shall not exceed the range limit after positive and negative immigration.
	Max. positive immigration: 500% of the min. measuring range
	Max. negative immigration: 600% of the min. measuring range
Temperature range	The range of operating temperature for the amplifier: -29 ～ +93℃
	The measuring element filled with silicon oil : -40 ～ +104℃
	Flange-type transducer filled with high-temperature silicon oil: +15 ～ +315℃; that filled with general silicon oil: -40 ～ +150℃
Volume intake capacity	＜0.16cm3
Damping (step response)	Continuously adjustable generally between 0.2s ～ 1.67s when filled with silicon oil.
Starting time	2s, preheating is unnecessary
Accuracy	± 0.1% FS; ± 0.25% FS; ± 0.5% FS
Dead zone	None (≤ 0.1%)
Stability	Not exceeding the absolute value of the basic error of the max. range within 6 months
Influence of temperature	Zero error≤±0.1%/55℃, total error ≤±0．2%/55℃
Influence of static pressure	Min. ±0．2%FS, Max. ±1%FS
Influence of vibration	In any axial direction, the error is ± 0.05% / g of the upper limit of the measuring range when the vibration frequency is 200Hz.
Influence of power supply	Less than 0.005% / V of the output range
Influence of load	The load has no influence on it if the power supply is stable
Influence of installing position	A maximum of 0.24KPa zero error can be generated, but it can be corrected, without influence on the measuring range
Structural materials	Isolating diaphragm: 316LSST, Hastelloy alloy C, monel, or tantalum.
	Gas exhaust / liquid discharge valve: 316LSST, Hastelloy alloy C, monel
	Flange and joint: Electroplated carbon steel, 316LSST, Hastelloy alloy C, or monel
	O – ring contacting medium: NBR, fluo rubber
	Liquid filled: Silicon oil or inertia oil
	Bolt: Electroplated carbon steel
	Enclosure of electronic parts: Low-copper aluminum alloy
Pressure guide connecting part	connecting screw hole on the pressurized vessel /chamber :1/ 4 ～ 18NPT,connecting screw hole on the pressure leading joint :1/ 2 ～ 14NPT.
Connecting hole of the signal wire	G1／2
Weight: Approx	3.5kg (excluding accessories)
Standard accessories	Flanged joints, gas exhaust valves liquid discharge valves and one copy of instruction manual have been provided for all the types upon delivery

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Required

Code	Type
DR	Micro differential pressure transducer
DP	Differential pressure transducer
HP	High static pressure differential pressure transducer
AP	Absolute pressure transducer
GP	Pressure transducer
LT	Flange type liquid level transducer
DP/GP	Remote differential pressure/pressure transducer

Code	Functions
E	4～20mA
S	4～20Ma HART protocol digital communication
L	4～20mA adjustable intelligent condition

Code	Static Pressure MPa
A	1
B	4
C	10
E	25
F	32

Code	Measuring range
2	0－0.125～1.5KPa
3	0－1.3～7.5 KPa
4	0－6.2～37.4 KPa
5	0－31～186.8 KPa
6	0－117～690 KPa
7	0－345～2068 KPa
8	0－1170～6890 KPa
9	0－3450～20680 KPa
0	0－6890～41370 KPa

Code	Structural material		
	Flange/joint	Liquid discharge/ gas exhaust valve	Diaphragm
22	316 SST	316 SST	316 SST
23	316 SST	316 SST	Hastelloy C
24	316 SST	316 SST	Monel
25	316 SST	316 SST	Tantalum
56	Hastelloy C	Hastelloy C	Hastelloy C

Additional/Random

Code	Additional functions
M1	Linear indicator (0～100% scale)
M2	Square root indicator (0～10 scale)
M4	3½-digit LCD indicator (0～100% linearity)
B1	Bent stand for pipe installation (pipe outside diameter Φ50～60)
B2	Bent stand for plate installation
B3	Flat stand for pipe installation (pipe outside diameterΦ50～60)
D1	Gas exhaust and liquid discharge valve for the upper part of the flange side
D2	Gas exhaust and liquid discharge valve for the lower part of the flange side
J	T-shaped joint, M20*1.5 male thread
M	"Waist-shaped" joint, NPT½" taper pipe thread
C12	NPT½" pressure guide transition joint and rear welding pressure guide pipe
D	Flameproof type: explosion-proof rating dII BTS
I	Intrinsically safe type: explosion-proof rating iaII CT6

eg. TK3051-DP-6-S-25-B-C12

Quick Selection Table

Ordering instructions

1) If there is positive and negative migration, the migration value must be indicated;
2) If the differential pressure transducer needs to be equipped with three-valve manifold, throttling device, this shall be specified separately;
3) For the purchase of a remote transducer, it shall be determined based on the needs as per the different remote flange selection table;
4) If the remote transducer needs to be used in a vacuum and high temperature situation, it shall be specially indicated in the order;
5) The material of contacting medium O-ring includes nitrile rubber and fluorine rubber.

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