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**FB0803**  
**Spread silicon type pressure transmitter**

**Operation Instruction**

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**1. Safety guidance**

- 1.1 The transmitter is not allowed to measure frozen medium otherwise it is will be damaged.
- 1.2 Only qualified or authorized persons can install ,connect or use and maintain the transmitter
- 1.3 In the electric connection , only use the qualified tool of dielectric strength.
- 1.4 Only qualified tools with enough installation strength can be use be when connecting the transmitter ,when connecting or using explosion-proof transmitter, you must follow relevant regulations or recommended standards.
- 1.5 Please read a operation instructions carefully before use the transmitter.

**2. Application areas and use**

- FB0803 series pressure transmitter can be applied in oil industry ,chemical Industry, power plant, metallic industry, pharmacy industry ,food industry ,etc.

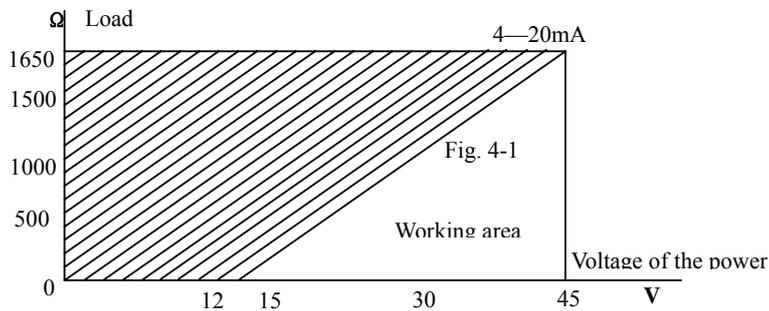
**3. Ordering number**

FB0803		spread the silicon pressure transmitter	
	code	measurement range	
	A	0 ~ 5KPa ~ 20KPa	
	B	0 ~ 20KPa ~ 70KPa	
	C	0 ~ 70KPa ~ 350KPa	
	D	0 ~ 200KPa ~ 700KPa	
E	0 ~ 700KPa ~ 3.5MPa		
F	0 ~ 2.0MPa ~ 7.0MPa		
G	0 ~ 7.0MPa ~ 35.0MPa		
	code	output signal	
	E	4 ~ 20 mA DC	
	9	special demand	
	code	grade of precision	
	1	0.1%	
	2	0.25%	
	code	pressure joining	
	R	standard M20 *1. 5outside screw thread	
	O	Make according to user-demand size	
	code	selection	
	i	Fundamentally safe ExiaIICT6	
	d	Explosion separate ExdII CT4	
	M1	Analogue indicator	
	M3	3 1/2LCD digital indicator	
	G	Gauge pressure measurement	
	A	Absolute pressure measurement	
	F	Negative pressure measurement	
	B	Sealed gauge pressure measurement	
	S	Heat radiator and process attachment	

⋮	⋮	⋮	⋮	⋮	Y	Demanded by the user
FB0803	A(0-10KPa)	1	R	i	←	example

#### 4. Technical parameter

Working voltage	12-30VDC Relevant equipment attach to the fundamental-safe type transmitter (must obtain the anti-blast certificate)
Output signal:	4mA ~20mA(analogue two-line model)
Measurement	Gauge pressure 0~5KPa ,0~3.5Mpa sealed gauge pressure 0~7MPa,0~35Mpa Absolute pressure 0~20KPa,0~35Mpa Negative pressure -0.1Mpa~2Mpa
Precision	grade of precision 0.1, 0.25 Temperature excursion $\pm 0.15\%F.S/10^{\circ}C$ Stability $\leq \pm 0.2\%F.S/year$ Influence position zero point is not be influenced with mouthing position
Condition operation	Normal working temperature $-20^{\circ}C \sim +70^{\circ}C$ Diaphragm $-20^{\circ}C \sim +80^{\circ}C$ Storage temperature $-20^{\circ}C \sim +80^{\circ}C$ High/ low storage temperature $-65^{\circ}C \sim +150^{\circ}C$ $10^{\circ}C \sim +200^{\circ}C$ $10^{\circ}C \sim +350^{\circ}C$ Relative humidity 0~95%RH Atmospheric pressure 86 Kpa~106KPa
Vibration influence	When the vibration frequency is (20-200) Hz in any direction ,the shift amount is smaller than $\pm 0.2\%F.S$
Strike influence	When the transmitter is stroke by 100G for 11ms from any direction, changing amount is smaller than $\pm 0.02\%F.S$
Protection grade	Superior to IP65
Load characteristic:	Two-line type load $R \leq 50(V-12)$ , refer to figure 4-1



#### 5. Operation principle and structure

##### 5.1 Operation principle

FB0803 series spread silicon pressure transmitter consist of pressure sense and signal pressing circuit .The pressure face of the sensor links to Whist electric bridge. When the pressure increase ,The resistant of every arm of the bridge changes Through the signal processing circuit ,These change is converted variation ,and finally , its covered into 4~20mA output .Please refer the meter to Fig. 5-1

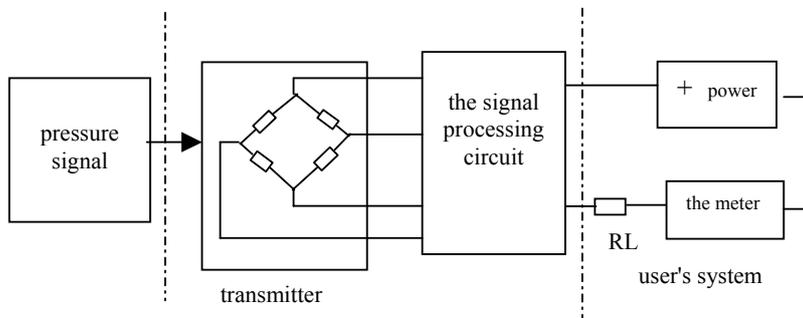


Fig. 5-1

## 5.2. Structure

FB0803 series spread silicon pressure transmitters appearance and structure

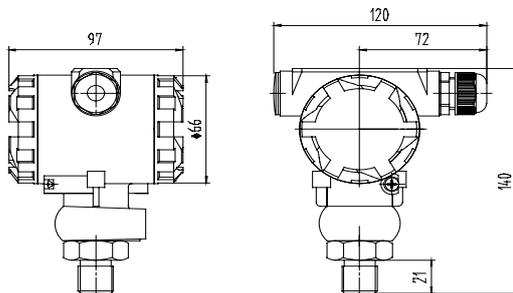


Fig. 5-2

## 6. Installation

- 6.1 The transmitter can be directly installed at the measured point, If the transmitter interface does not fit the measured points interfere, you may use a self-made conjecture part.
- 6.2 Please install the transmitter in a place with litter temperature, avoid strong vibration and strike fluctuation.
- 6.3 When installing the transmitter in a outdoor place please try your best to a protection box keep, so that to keep it from direct sunshine and run.
- 6.4 When measuring steam or other high-temperature medium, be aware to avoid the working temperature exceed the limit. When necessary, you may consider use cooling devices.
- 6.5 You must add a pressure-cutting valve ,between the transmitter and the measured medium so as to make easy and avoid influences to the measuring precision caused by the join

## 7. Wiring

- The signal terminals of the transmitter are placed in a cabin. Take off the back cover while wiring. There are two terminals of the indicator (refer to fig.7-1).Both the current of the testing terminal, and the current of the signal terminal are 4~20mADC .These may be linked to the indicator for testing.

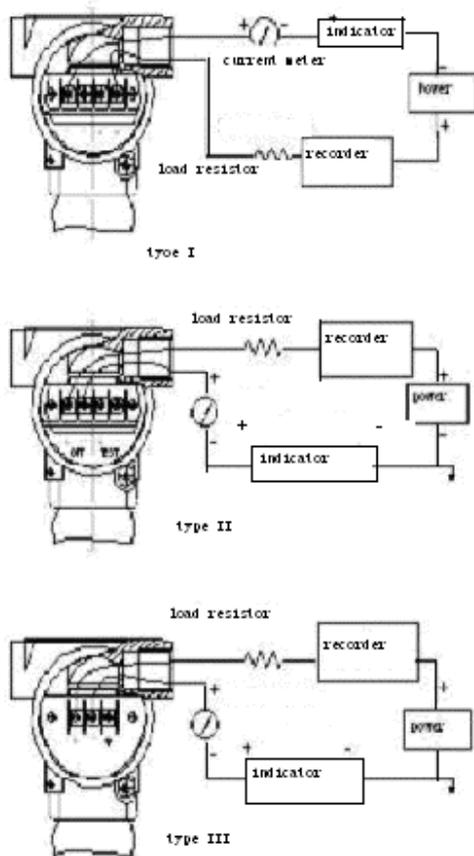


Fig. 7-1

- The power is linked to the transmitter via signal lines. You must be aware not to link the power signal lines to the testing terminals or the diode connected to the testing terminal will broke .If the diode broke ,it must be replace with a new one or you may join the two testing terminals .
- Two holes on the top of the transmitter must be plug up with cables or assembled with signal lines ,and the signal lines should be fastened with a screw cap .Tap unnecessary connection hole must be sealed.

## 8. Correction

- The transmitter has been corrected to the best state according to user needs before it leaves the factory. Normally it does not need to be correct by the user .But under the following situations it need to be corrected again .
  - A. The transmitter has been dropped, strongly struck
  - B. The transmitter has been stored for longer than one year
  - C. After running for a long time, errors bigger than the precision range was found
  - D. Planned check by the user.

### 8.1 Wiring diagram for correction

- A. Diagram of the transmitters correction system

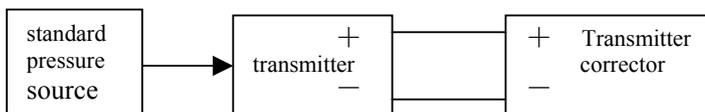
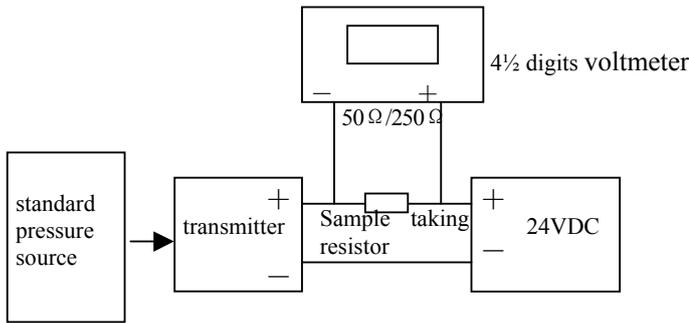


Fig. 8-1

B. The transmitter corrector may be replaced with 24VDC steady voltage power , 250 Ω or 50 Ω standard resistor 4½ digit voltmeter.



The Fig. 8-2

### 8.2 Instruments needed when correcting the transmitter

Instrument name	measure the range and precision	备注
Transmitter examiner	0~30mA, +0.05%with24VDC	
digital pressure gauge	0~20KPa±0.05%FS	Select one according to the scale
digital pressure gauge	0~2MPa±0.05%FS	
piston type pressure gauge	0~60MPa±0.05%FS	
pressure signal source	Air-driver corrector small-pressure controller	
24V steady voltage power	24VDC±10%	used when there is no transmitter corrector
Standard resist	250Ω (or 50Ω) ±0.01%	
digital voltmeter	4½ digit voltmeter , precision 0.01	
digital voltmeter	4½ digit voltmeter , precision 0.01	

### 8.3 Correction method

- Before correction ,please check the polarity and voltage , make sure not to directly join the transmitter with 220V alternating current power .Then check whether there is leak in the air way .when you are sure every thing is fine ,turn on the power. The zero point amendable resistors are placed in the cabin along with the circuit board
- A. Join the pressure signal source with the transmitter connection terminal, and make sure they are sealed well.
- B. User the pressure signal generator to input zero-point pressure signal .If the transmitter indicates zero, then let the transmitter link to the atmosphere. Now the output of the transmitter should be 1.000V (or 4.00mA) ,otherwise you need to adjust the zero-point amendable resistor.
- C. Use the pressure signal generator to input full-scale pressure signal to the transmitter thus the output of the transmitter should be 5.000V (or 20.00mA), otherwise you need to adjust the full-scale amendable resistor

- D. Repeat (B) (C) for several times, thus you can correct the scale.
- E. Zero- point correction range is  $\pm 5\%$ ; full-scale correction range is  $\pm 20\%$

**9. Explosion-proof type transmitter operation instruction**

9.1. Kinds of explosion-proof and their signs

This series of transmitter are sorted into two kinds: explosion-isolation type and fundamentally-safe type .These two types must be examined by national explosion-proof examination organization and be granted a certificate.

- A. Explosion separated type: ExdIICT6

Certificate No. CNEx04. 635

- B. Fundamentally safe type: ExiaIICT6

Certificate No. CNEx04. 827

9.2. Types grade and temperature grade explosion-proof electric instruments applied in explosive environment

9.2.1. Types

Type I: Electrical instruments applied in coal mineral wells

Type II: Factory electrical instruments except for those applied in coal mine.

FB0803 transmitter belongs to type II.

9.2.2 Grade and temperature grade

Type II electrical instruments are divide into grade A,B,C according to MESG and MIC (refer to Table 1) .In addition, they are divide into group T1~T6 according to their face temperature (see Table 2)

Table 1

Grade	MESG(mm)	MIC
II A	MESG>0.9	MIC>0.8
II B	0.9 $\geq$ MESG $\geq$ 0.5	0.8 $\geq$ MIC $\geq$ 0.45
II C	0.5>MESG	0.45>MIC

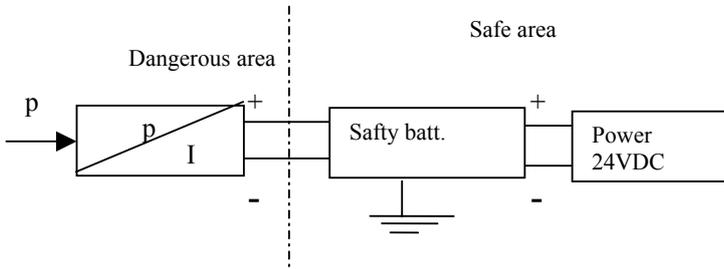
Table 2

Temperature group	T1	T2	T3	T4	T5	T6
The highest temperature allowed (°C)	450	300	200	135	100	85

**10. Attention need be paid when installing or using the pressure transmitter**

- Tighten the cap when using the transmitter in dangerous, places. Users are forbidden to open the cap when the transmitter is power on.
- When installing a explosion-isolated transmitter, you must make sure that the mouth where the cables come through be sealed well. The case of the transmitter must be electrically linked to the ground.
- A fundamentally-safe must be installed along with a safety isolator

(See Fig 10-1)



$U_i, I_i, P_i, C_i, L_i$        $U_o, I_o, P_o, C_o, L_o$   
 $U_i=28VDC$     $I_i=30mADC$     $P_i=0.84W$     $C_i=0.04\mu F$     $L_i=0.1mH$     $U_m=250VDC$   
 $U_o \leq U_i$        $I_o \leq I_i$        $P_o \leq P_i$        $C_o = C_p + C_i$        $L_o = L_p + L_i$

Fig. 10-1

- For safety, please separate fundamentally-safe loop and other loops
- When measuring high temperature exceed the working temperature medium, be aware not to let the medium temperature exceed the working temperature limit of the transmitter.

### 11. Maintenance and error handling

After the transmitter begins operate, please regularly check its fundamental function, correct the zero-point.

Some familiar error and their treatment method are as below:

error	cause	treatment method
No output	Wrong power voltage	Make the power voltage fit the load resistor
	Wrong load resistor	Correct
	Wrong power polarity	Join it
	Output loop broken	Join it
Too big error output exceeds 100% or 0%	Wrong measuring loop	Check the wing and working state of power supplier second class meter and the transmitter.
	Zero-point ,scale or polarity amendable resistor been damaged	Replace the broken component, correct zero-point again