SIPNA™ ZEO -131

Reference Manual

HART
COMMUNICATION PROTOCOL

Ex

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General description

This series of temperature transmitter is a kind of intelligent type, used for field installation, with electrical isolation, support HART protocol. It receive signal then convert 4-20mA and stack HART signal output, like thermal resistance, thermocouple, resistance, millivolt.
The transmitter can field configuration through instrument panel button or HART hand operated device, also can through one USB interface HART modem to connect to PC configuration

Functional specifications

Thermal resistance / resistance
RTD thermal resistance
Pt100 / Pt1000 comply with IEC60751 standards
Resistance value
0...400
0....4000

Connecting cable
the biggest sensor circuit resistance of each line (RW) : 50
conform to NE89 (Jan 2009) specifications
second line circuit:Maximum compensation 100 line total resistance

Sensor fault signal

RTD: Short circuit and circuit breaker
Linear resistance measurement:circuit breaker

Thermocouple / voltage

Graduation No.
K, N, E, J, T, B, R, S comply with IEC60584 standards

Voltage value
-125...125mV

Connecting cable
the biggest sensor circuit resistance of each line (RW) : 1.5K , total resistance 3K

Input resistance
＞10M

Internal temperature compensator
Pt100,IEC 60751 C1.B

Sensor fault signal
Thermocouple: circuit breaker
Linear voltage measurement: circuit breaker

Transmission characteristics
output into a linear with temperature, resistance, voltage

Output signal
4-20mA stack HART digital signal

Fault current signal

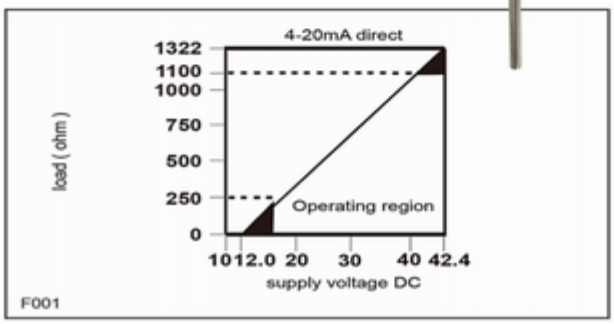
	Standard
Linear output	3.9≤I≤20.5
"hight" fault	20.5≤I≤21.75 (default)
"low" fault	I≤3.9 (MCU fault)

Power supply (support reverse polarity protection)

Two wire system, power line is equal to the signal line

The supply voltage
the working voltage is 12-35V

Load resistance
R load= (E-12) / 0.0236
E is the power supply voltage



Basic information

Electrical insulation
1KV AC (input / output)

Input filter
50 / 60 HZ

Damping time
can be set 1-32S, default is 1s

refresh rate
≤0.5S

Operating temperature
-40℃-85℃
when the temperature is lower than -30℃, LCD could not display as normal, and the display update rate will be reduced

Transport / storage temperature
-50℃-85℃

Maximum permissible humidity
5-100% RH

Physical specifications

Outline dimension
See section size of section 6th

Joint box compound
Low copper aluminum die-casting

Color
Blue RAL9002

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Install
The transmitter can be mounted directly to the sensor
it also can be achieved through the installation of remote installation support

Electrical connection
Two-exit with M20*1.5 or NPT1/2 (throuth by transfer joint)

Protection level
IP66 and IP67

Weight
1KG

Performance specifications

Measurement accuracy
See tabe 1 in page 2

Cold end compensation precision
Pt100 DIN IEC 60751 C1.B, 0.3℃ (Just for thermocouple)

Ambient temperature effect
See table 1 in page 2

Power effect
Power supply effects caused by voltage per volt is 0.005%

Stability
0.1 or 0.1% of temperature transmitter reading in 12 months (with large value)

Seismic performance
In the process of transportation and working, 10-60 HZ 0.21mm displayment
60-2000 HZ 3g

Electromagnetic compatibility
Conform to IEC61326 (2006) and NAMUR NE21 grade requirement

Table 1 Measurement accuracy and ambient temperature effect

		Measuring range	Measurement accuracy [1]		Ambient temperature effect by each 1℃ [2]	
Standard	Sensor		Fixed	Range	Fixed	Range
Thermal resistance / resistance						
IEC60751	Pt100	-200 ... 850 °C	±0.1℃	±0.1%	±0.006 °C	± 0.004%
	Pt1000	-200 ... 850 °C	±0.1℃	±0.1%	±0.006 °C	± 0.004%
	Resistance measurement	0 ...400Ω	0.035Ω	±0.1%	0.028Ω	± 0.004%
	Resistance measurement	0 ...4000Ω	0.35Ω	±0.1%	0.028Ω	± 0.004%
Thermocouple / voltage						
IEC60584	N	-270 ... 1300 °C	±0.8℃	±0.1%	±0.02 °C	± 0.004%
	K	-270 ... 1372 °C	±0.8℃	±0.1%	±0.02 °C	± 0.004%
	E	-270 ... 1000 °C	±0.8℃	±0.1%	±0.02 °C	± 0.004%
	J	-210 ... 1200 °C	±0.8℃	±0.1%	±0.02 °C	± 0.004%
	T	-270 ... 400 °C	±0.8℃	±0.1%	±0.02 °C	± 0.004%
	B	0 ... 1820 °C	±1℃	±0.1%	±0.06 °C	± 0.004%
	R	-50 ... 1768 °C	±1℃	±0.1%	±0.06 °C	± 0.004%
	S	-50 ... 1768 °C	±1℃	±0.1%	±0.06 °C	± 0.004%
	Voltage measurement	-125 ... 125 mv	0.02mv	±0.1%	0.001mv	± 0.004%

Remarks: 1) The measurement precision is the large value of the fixed value and the measuring range
2) The influence of environmental temperature change is the large value of the fixed value and the range value

Man-machine interface

F002

Graphic controlled by the transmitter (alphanumeric) LCD display
Character height depends on the mode
Sign, 4 digit, 2 decimal places
Bar chart display
Angle of arbitrary rotating LCD display

Display options
Sensor process data
Sensor electrical data (ohm / mV)
Electronic components / ambient temperature
Output value
Output rate %
Display diagnostic information associated with the status of the transmitter and sensor

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Using ▲ and ▼ button can browse the menu or select a parameter value or character.

Different functions assigned to ◥ and ◢ buttons. The function that is currently assigned to these buttons is displayed on the display screen..

◥	Meaning
Exit	Exit the menu
Back	Return to a sub menu
Cancel	Cancel parameter input
Next	Select the numeric value and the next bit of the letter

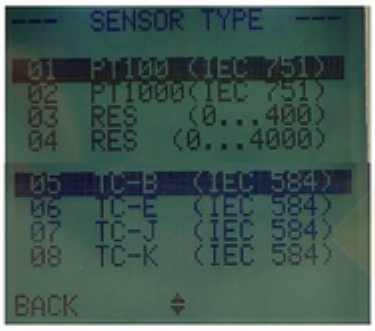
◢	Meaning
Select	Select sub menu / parameter
Edit	Edit parameter
OK	Save input parameter

2.2.3 Menu Tree

Step 1, press ◥ button enter the main menu. Press ▲ or ▼ button can browse tne menu, the menu is selected to light black form.

MAIN MENU: main menu
SENSOR-TYPE: the type of sensor
SENSOR-RANGE: the range of sensor
DEVICE-INFO: transmitter information
DAMPING: damping
SAVE SET: save settings

Step 2 , press ◢ button get into sub menu of SENSOR-TYPE, press ▲ or ▼ button can choose different type of sensor, the sensor type is selected in the form of bringht black



01 PT100 (IEC751): thermal resistance, graduation number Pt100
02 PT1000 (IEC751): thermal resistance, graduation number Pt1000
03 RES (0-400): resistance input 0-400Ω
04 RES (0-4000): resistance input 0-4000Ω
05 TC-B (IEC584): thermocouple, graduation number B
06 TC-E (IEC584): thermocouple, graduation number E
07 TC-J (IEC584): thermocouple, graduation number J
08 TC-K (IEC584): thermocouple, graduation number K
09 TC-N (IEC584): thermocouple, graduation number N
10 TC-R (IEC584): thermocouple, graduation number R
11 TC-S (IEC584): thermocouple, graduation number S
12 TC-T (IEC584): thermocouple, graduation number T
13 mV (-125-125) : voltage input, -125-125mV
Factory Reset: factory reset

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Step3, press button get into sub menu of WIRE MENU (connection menu), press or button can choose different way of connecting mode, the connecting mode is selected in the form of bringht black

WIRE MENU: connection menu
02 2-Wire: two-wire
03 3-Wire: three-wire
04 4-Wire: four-wire
*Thermal resistance choose different way of connection mode according to need, usually it is 3-wire
*Thermocouple is 2-wire

Step4, press button to back the main menu, press button get into sub menu of SENSOR-RANGE, setting the sensor range

URV: range up limit
LRV: range low limit

Press button can move the number of digits which need to adjust, it is showed by the 01 icon on the LCD display

Press or button can decrease or increase number (press button to zero, continue to press it, it will show negative numbers signs)

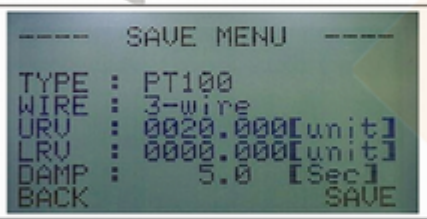
Step5, press button to back the main menu, jump to the step7 or press button can get into sub menu of DEVICE-INFO (transmitter information), can see the equipment information of the transmitter (users do not neet to get into this menu usually)

Date: 2014-06-01 date
Hardware: Ver 5.0 hardware version number
Software: Ver 2.0 software version number
Device ID:> 062102 equipment information

Step6, press button back to the main menu, jump to the step7 or press button can get into sub menu of DAMPING, press or button increase or decrease the damping time of transmitter. (usually the default time is 2s, user do not need to reset it anymore)

2.0 (Sec): damping time 2 seconds

Step7,press button back to the main menu, press button can get into sub menu of SAVE SET, press button save all configuration, continuity press button back to the display interface.



TYPE: Pt100 thermal resistance
WIRE: 3-wire
URV: 0200.000 (unit)
LRV: 0000.00 (unit)
DAMP: 2.0 (Sec)

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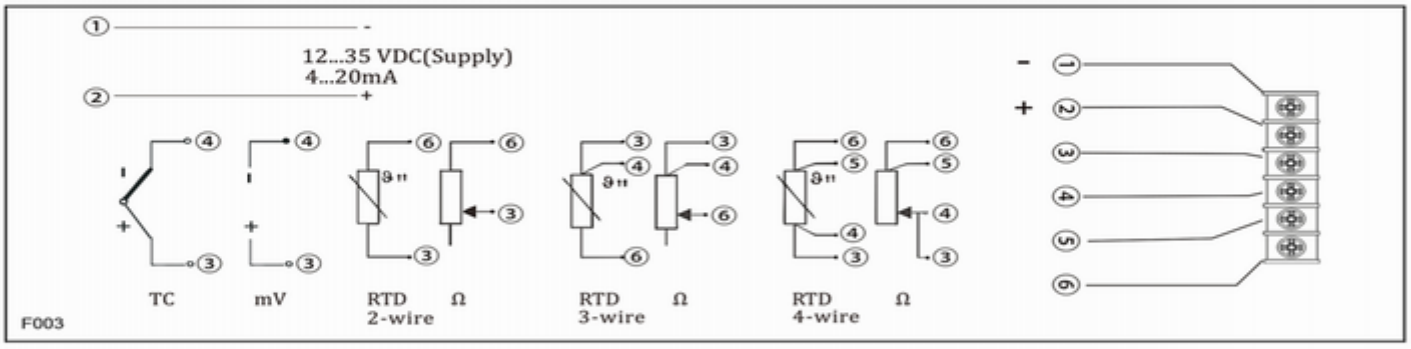
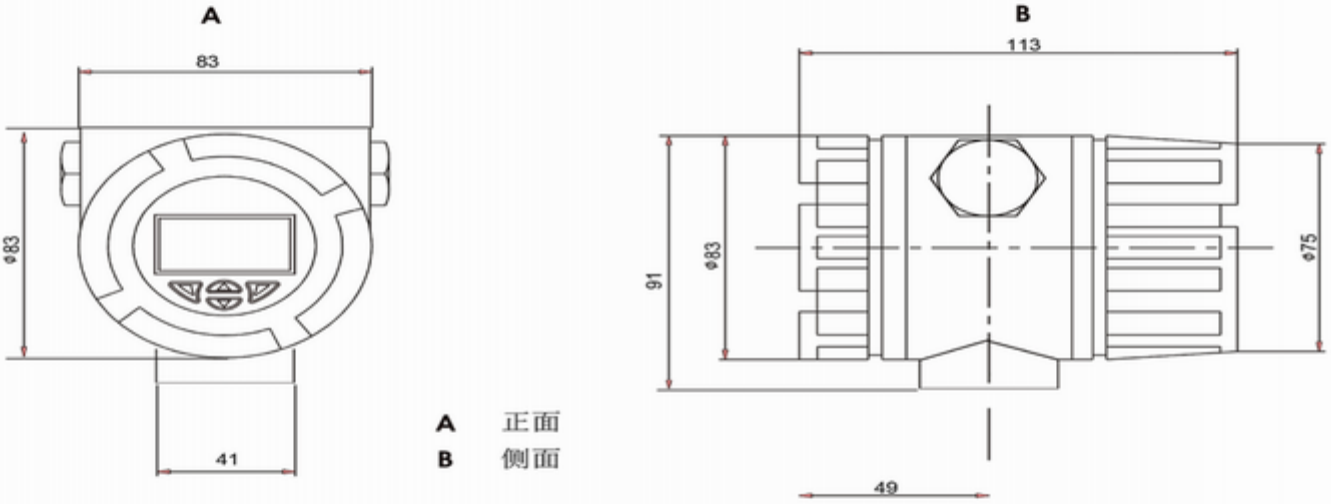
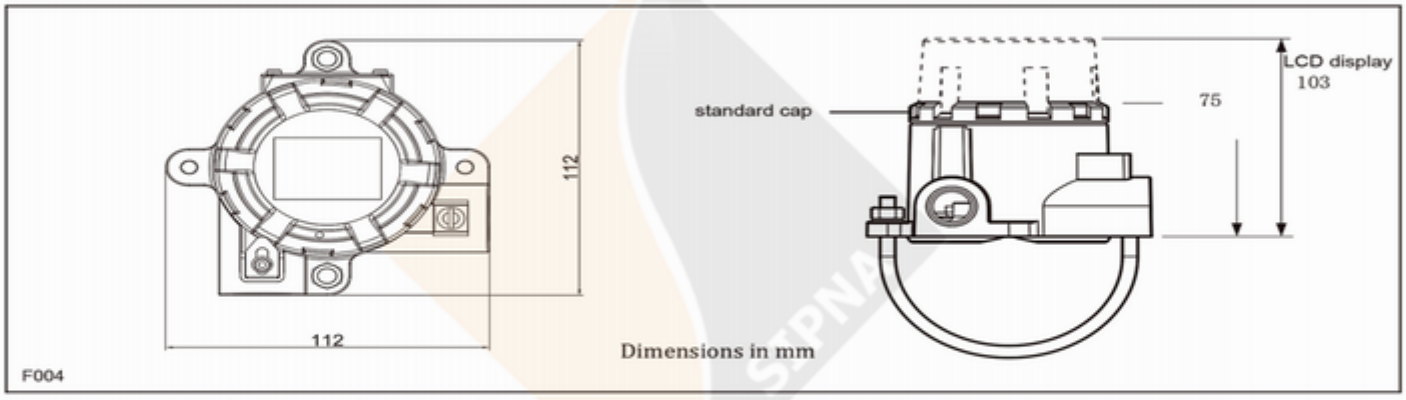
Electrical wiring



Outline dimension





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