SISCO 4 Digit Digital Panel Meter User's Manual

Thank you for purchasing the DPM4 Series Single Input Channel Intelligent Digital Indicator.

This User's Manual is an essential instruction for the correct selection, calibration, configuration, application and maintenance of this product.

This User's Manual should be read by those who use and maintain the DPM4 Series.

Be sure to keep this User's Manual nearby for handy reference.

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CONTENTS

1 General

DPM4 Series Single Input Channel Intelligent Digital Indicators can be used with variety of analog output sensors and transmitters to accomplish the measurement, transfer, display, transmission, recording and control of temperature, pressure, level, component, force and displacement, etc.

- The Intrinsic Error is less than 0.5%F·S. Its calibration and digital filtering functions can help reduce the errors of the sensors and transmitters so as to effectively enhance the accuracy of measurement and control of the system.
- It is adaptable to such signals as voltage, current, RTD, T/C, etc.
- 2-point alarm output is available, Each alarm output have 2 selectable alarm types: Upper limit alarm and Lower limit alarm. The alarm hysteresis can be set separately.
- Re-Transmitted Output can provide other devices with the displaying value in the form of standard current or voltage output. The displaying value is measured and transformed by the instrument.

2 Models Numbers

1 2 3 4 5 6 7

DPM4 / ☐ — ☐ R T A ☐ B ☐ ☐

- 1: Dimensions （W × H × L）

  A: 160 × 80 × 125 or 80 × 160 × 125

  B: 96 × 96 × 76

  C: 96 × 48 × 82 or 48 × 96 × 82

  D: 72 × 72 × 75

  E: 48 × 48 × 108

- 2: Faceplate Types H: Horizontal Type
  S: Vertical Type
  F: Square Type

- 3: Display Types:

  R: Measured Value（Red）

- 4: The Number of Alarm Outputs

  T: 2 Alarm Outputs

- 5: Re-Transmitted Output

  A0: No Output

  A1: DC Current Output（4 mA ~20 mA）,（0 mA ~10 mA）or（0 mA ~20 mA）

  A2: DC Voltage Output（0 V ~5 V）,（1 V ~5 V）

- 6: Power Supply Output

B0 : No

B1 : 24V DC

B2 : 12V DC

- 7 : Input Signal

E : Thermocouple or Radiation Thermometer

R : RTD or Resistance

I : DC Current

V : DC Voltage

3 Specifications

- Power Supply : 85V~220VAC, 100VDC~380VDC, power consumption less than 4VA.
- Operating Conditions: 0℃~50℃, Humidity less than 85%R·H.
- Display range: -1999~9999, the position of the decimal point can be set.
- Types of the input signal:

Voltage: 1V~5V DC or 0V~5V DC is selectable by settings.

Current: 4mA~20mA, 0mA~10mA or 0mA~20mA is selectable by settings.

RTD: Pt100, Cu100, Cu50, BA1, BA2 or G53 is selectable by settings.

Thermocouple: K, S, R, B, N, E, J, T is selectable by settings.

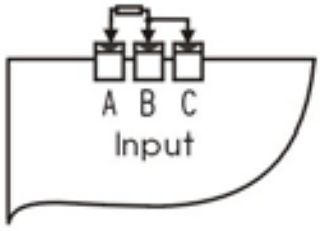
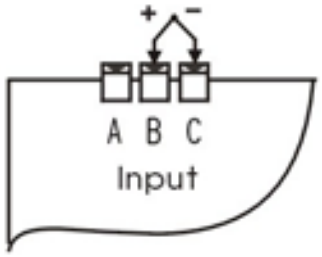
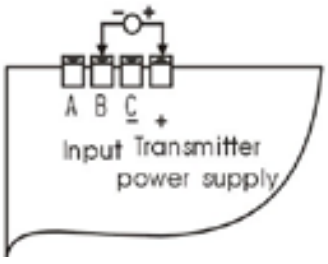
Input signal type		Display Range	Input signal type		Display Range
Voltage	0~5VDC	-1999~9999	Thermocouple	K	-100~1300℃
	1~5VDC			S	0~1700℃
	0~10VDC			R	0~1700℃
Current	4~20mA	-1999~9999		B	500~1800℃
	0~10mA			E	-100~800℃
	0~20mA			J	-100~1100℃
RTD	Pt100	-200.0~500.0℃		T	-100~400℃
	Cu100	-50.0~150.0℃			
	Cu50	-50.0~150.0℃			
	BA1	-200.0~650.0℃			
	BA2	-200.0~500.0℃			
	G53	-50.0~150.0℃			

- Intrinsic Error： Less than ± 0.5%F.S
- Periods of measurement and control： 0.2 seconds

  Alarm Output : 2Alarm Outputs, Contact capability 220V AC, 3A
- Re-Transmitted Output
  - Photo-isolation
  - 4mA~20mA, 0mA~10mA or 0mA~20mA DC current output, is selectable by settings. Load capability more than 600Ω
  - 1V~5V, 0V~5V or 0V~10V DC voltage output, remark on order.
  - Resolution of output： 1/1000, error less than ± 0.5% F.S
- Power Supply output
  - Universal Power Supply： Used for supplying power to Transmitter, the error of output value from nominal value is less than ± 5%, load capacity is more than 50mA.
  - For 24V DC, 12V DC, 5V DC or other specifications, notification is needed on order.

4 Mounting & Wiring

❗ For the sake of safety, turn off the power supply before wiring.

<table>
<tr><td>（1）Connection with RTD or Pressure Gauges with Resistance Transmitter</td><td>（2）Connection with Thermocouples and Current, Voltage Inputs</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>（3）Connection with Current signal of 2-wire Transmitter</td><td>（4）Connection with 3-wire, 4-wire Voltage, Current Transmitter</td></tr>
<tr><td>160×80 (A-H)
80×160 (A-S)
96×96 (B-F)
96×48 (C-H)
48×96 (C-S)
72×72 (D-F)
 
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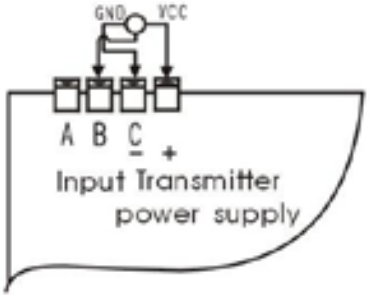
72×72 (D-F)
 
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 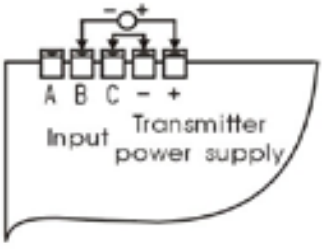
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 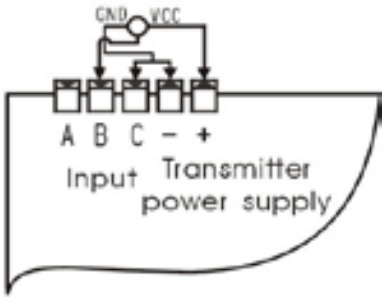
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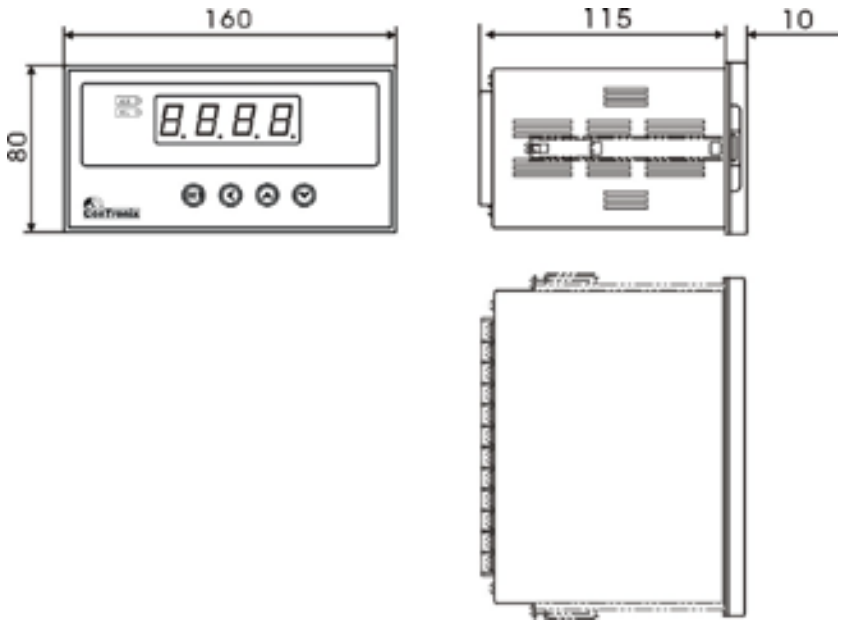
➢ A-H Model Dimensions of 160×80（mm）

Dimensions



Cut-out Dimensions

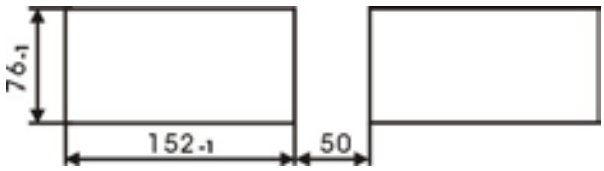
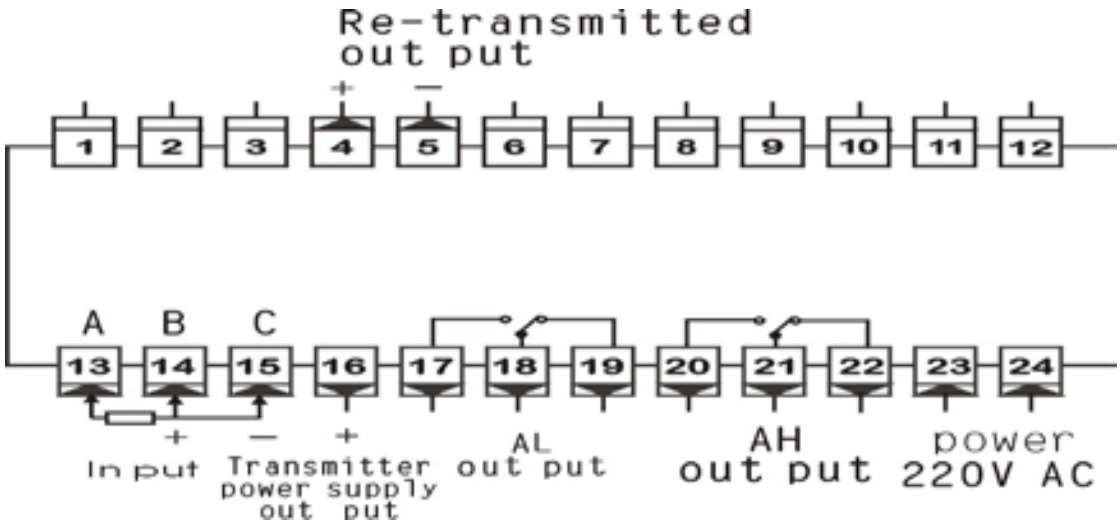
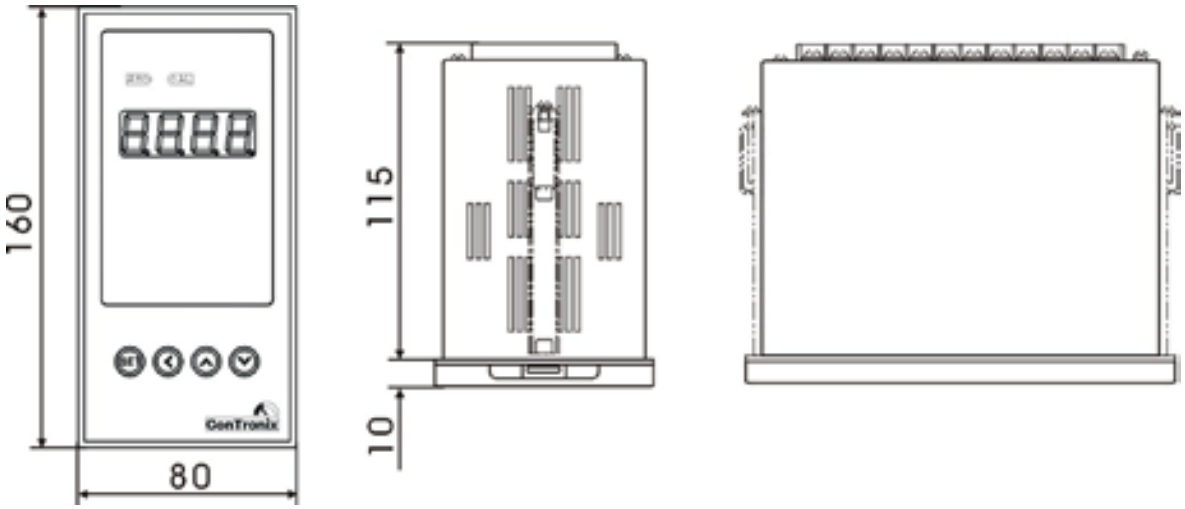


Diagram of Connecting Terminals



A-S Model　Dimensions of 80×160（mm）

Dimensions



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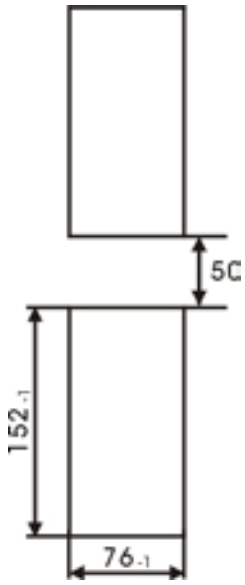
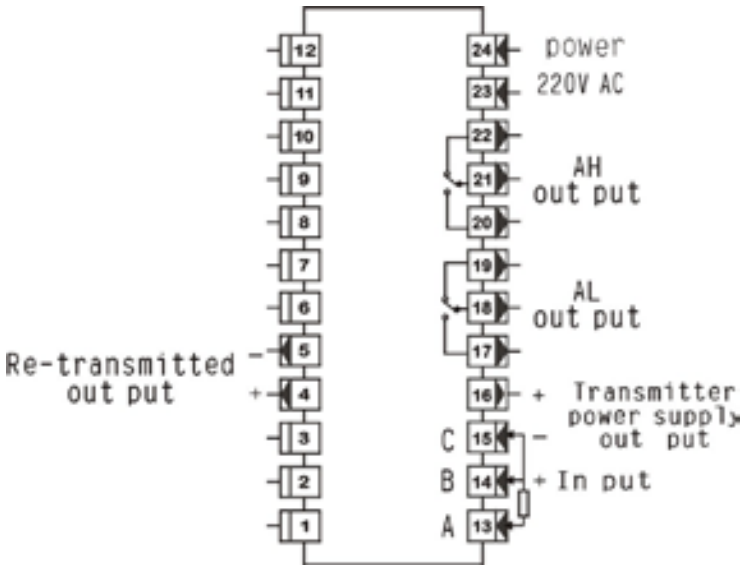
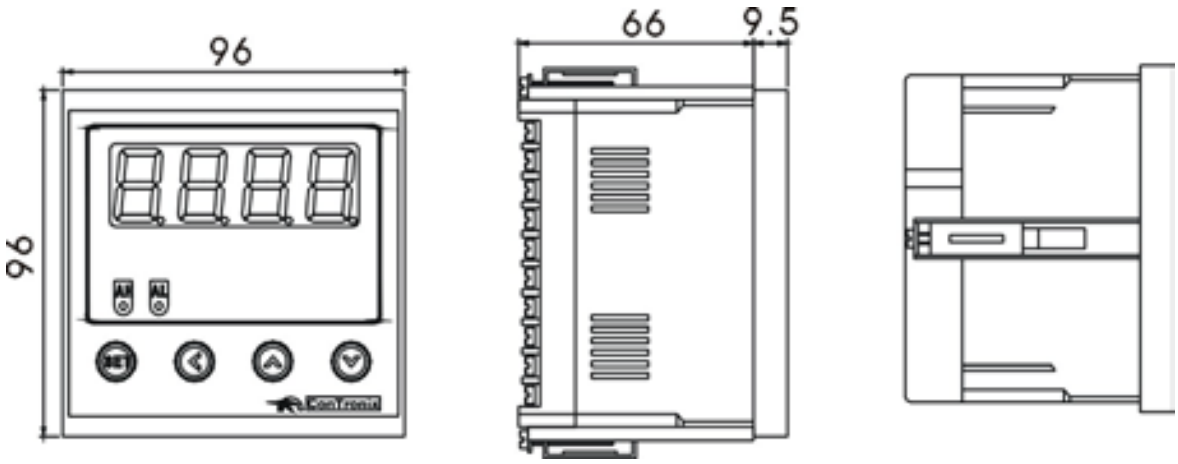


Diagram of Connecting Terminals



➢ B-F Model Dimensions of 96×96（mm）

Dimensions



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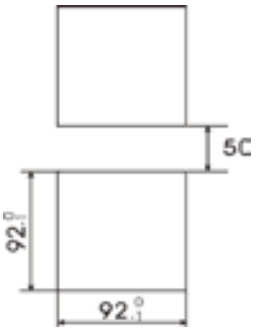
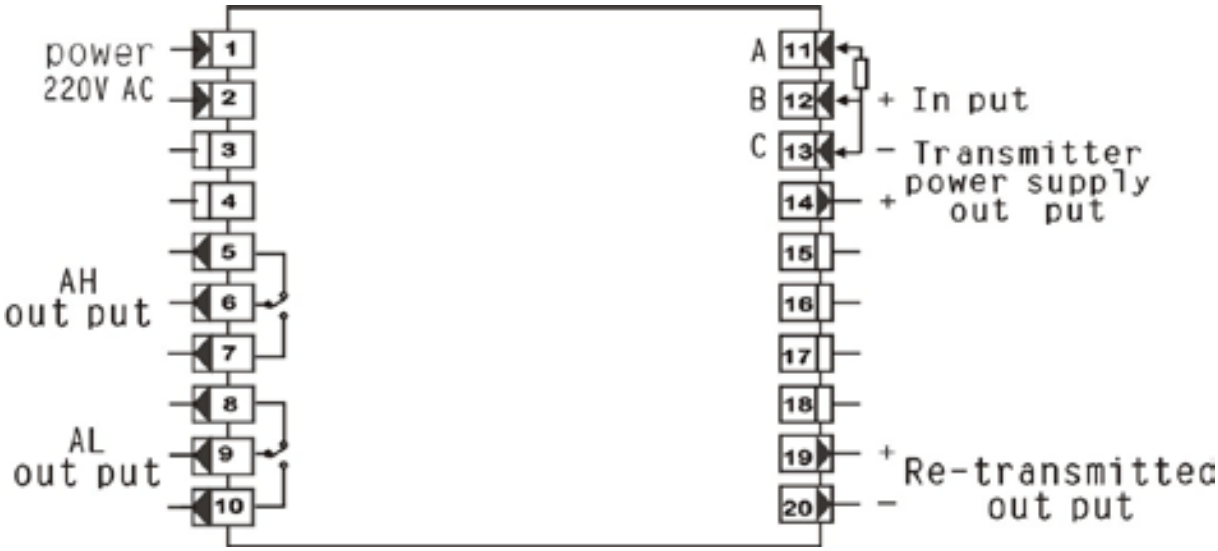
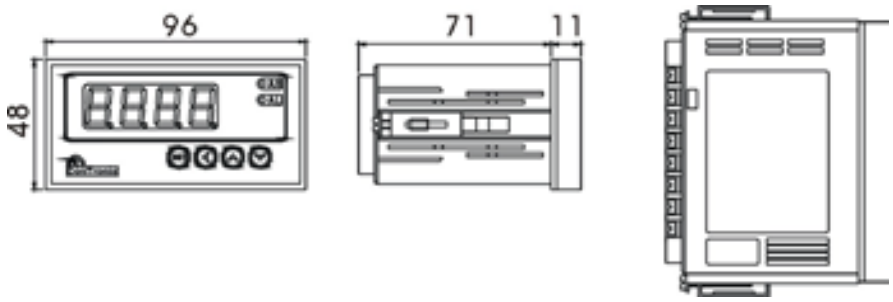


Diagram of Connecting Terminals



C-H Model　Dimensions of 96×48（mm）

Dimensions



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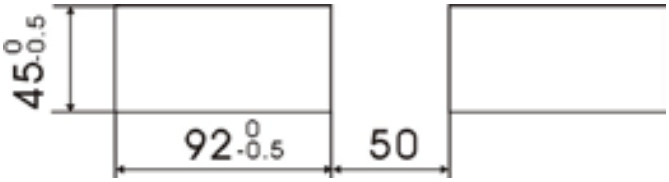
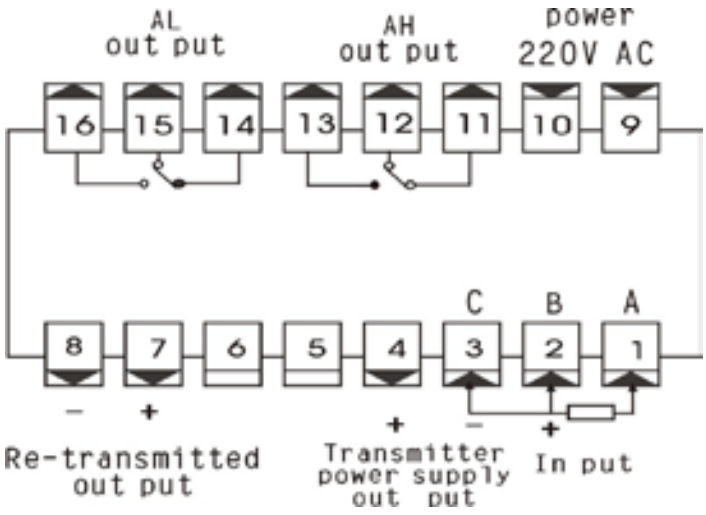
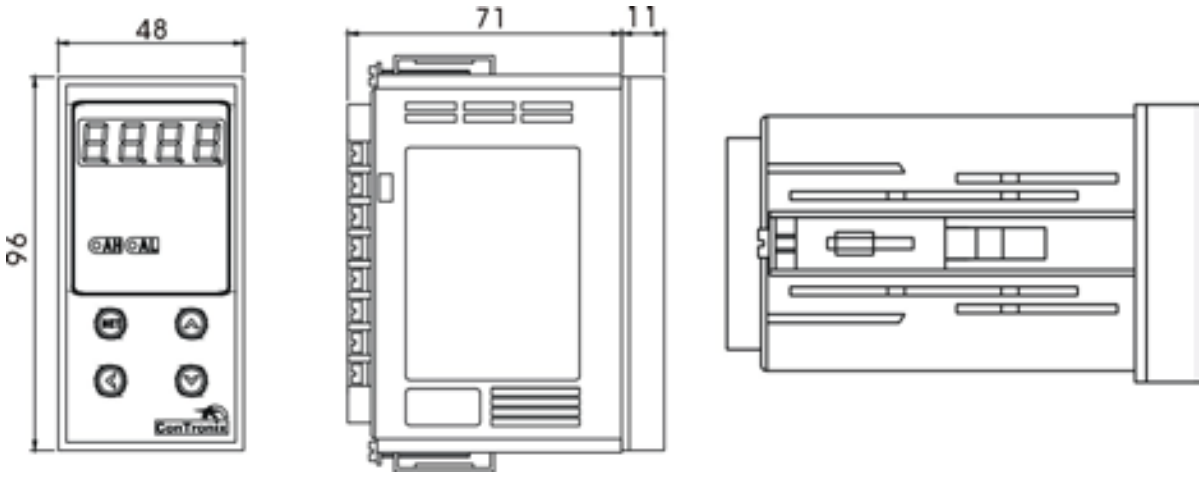


Diagram of Connecting Terminals

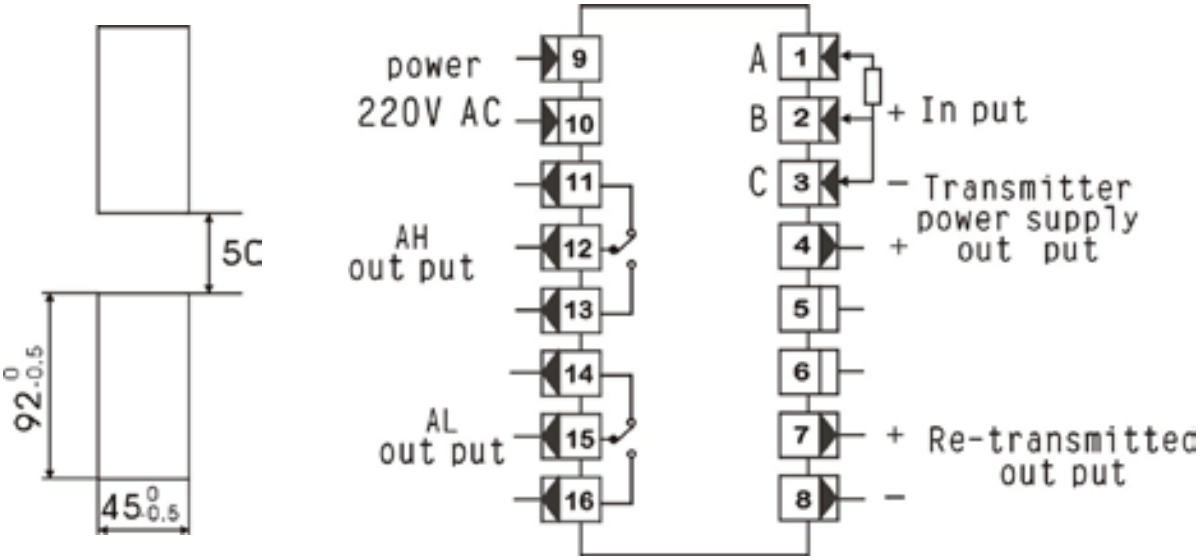


➢ C-S Model Dimensions of 48×96（mm）

Dimensions

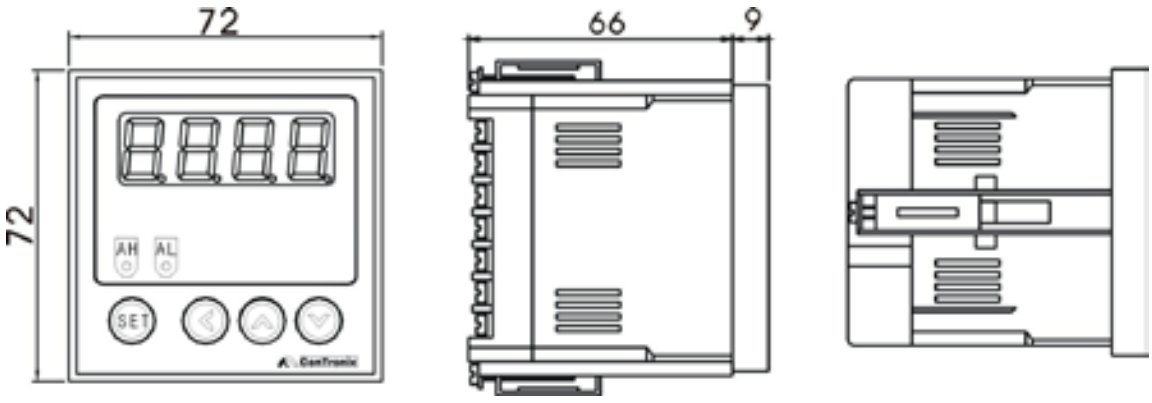


Cut-out Dimensions Diagram of Connecting Terminals



➢ D-F Model Dimensions of 72 × 72 (mm)

Dimensions



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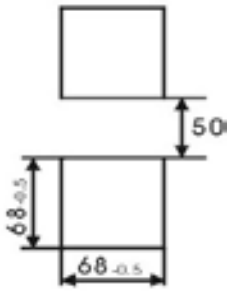
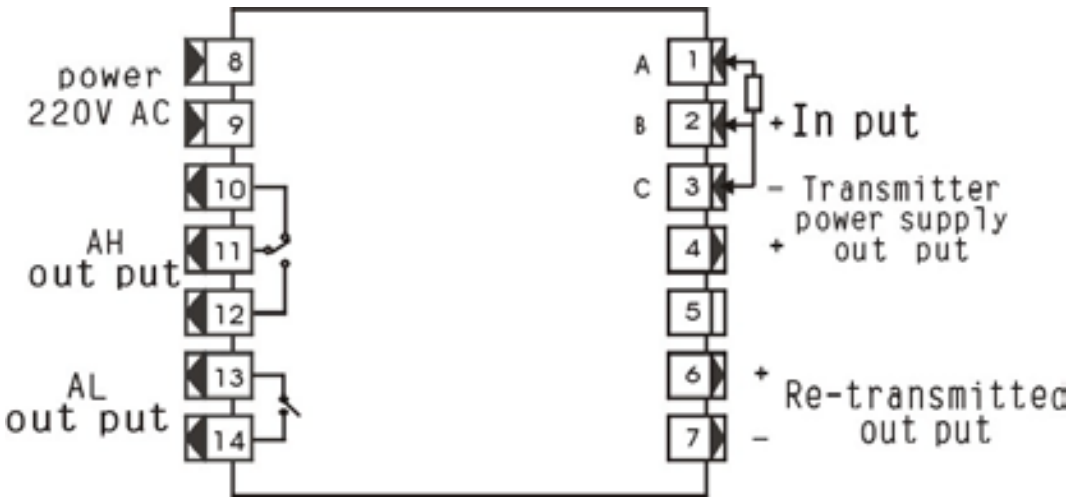
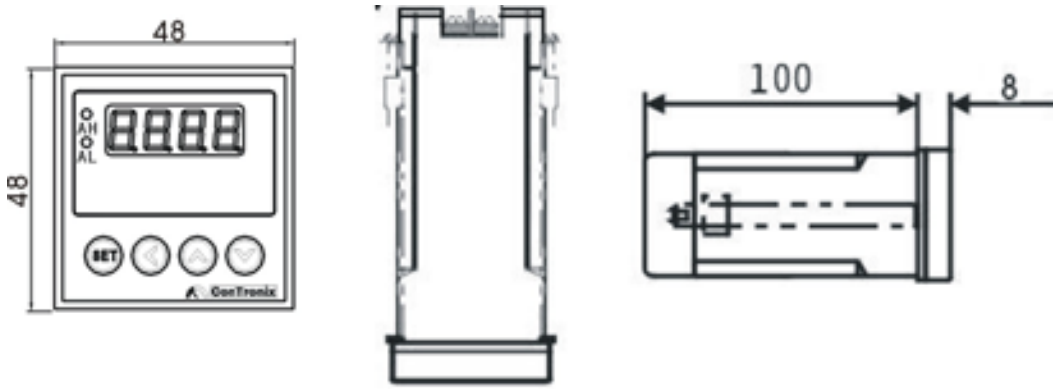


Diagram of Connecting Terminals



➢ E-F Model Dimensions of 48×48（mm）

Dimensions



Cut-out Dimensions

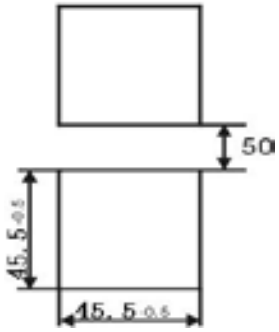
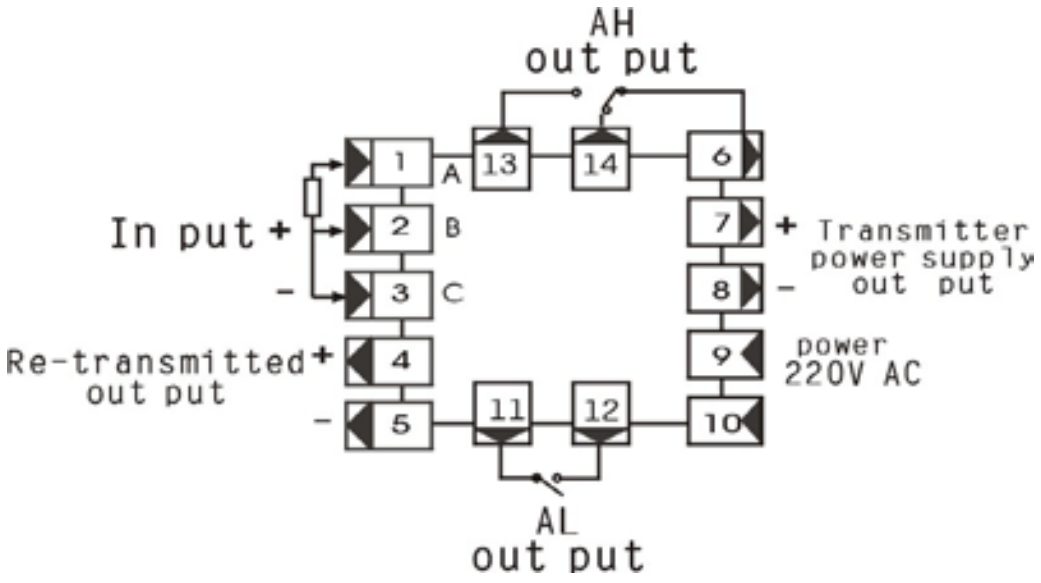


Diagram of Connecting Terminals



5 Parameter Tables

➢ 1st Group of parameter

Signs	Name	Item	Setting Range	Remarks
AH	AH	The 1st Alarm Point Set Value	-1999~9999	7.2
AL	AL	The 2nd Alarm Point Set Value	-1999~9999	7.2
oA	oA	Security Code		6.4
ALo1	ALo1	The 1st Alarm Point Type		7.2
ALo2	ALo2	The 2nd Alarm Point Type		7.2
HYA1	HYA1	The 1st Alarm Point Hysterisis	0~8000	7.2
HYA2	HYA2	The 2nd Alarm Point Hysterisis	0~8000	7.2

➢ 2nd Group of Parameters

Signs	Name	Item	Setting Range	Remarks
incH	incH	Input Signal Mode		7.1
in-d	in-d	Indication of Decimal Point Position		7.1
u-r	u-r	Lower Range	-1999~9999	7.1
F-r	F-r	Upper Range	-1999~9999	7.1
in-A	in-A	Zero Correcting Value	-1999~9999	8
Fi	Fi	Full Scale Correcting Value	0.500~1.500	8

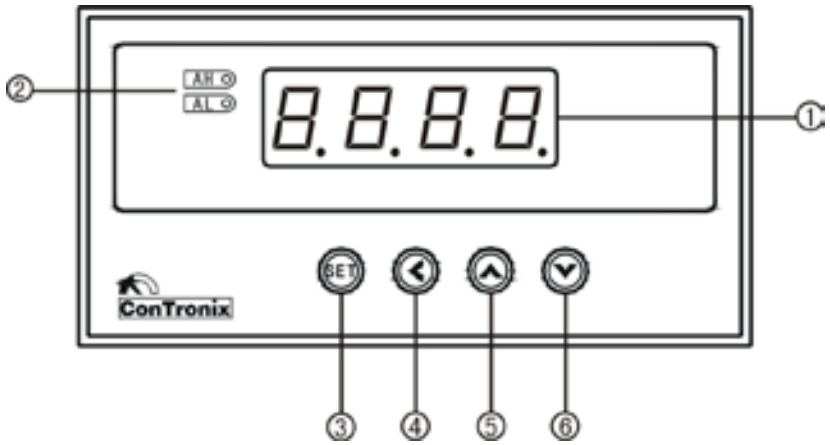
FLtr	FLtr	Digital Filter Time Constant	1 ~ 20	8
LA	LA	Cold Junction Compensate Correcting Value	-99-99	8
oA1	oA1	Alarm Setting Code Selection		6.2
bout	bout	Substitute in Fault	-1999~9999	★
oP	oP	Re-Transmitted Output Mode		7.3
bA-L	bA-L	Lower Range of Re-Transmitted Output	-1999~9999	7.3
bA-H	bA-H	Upper Range of Re-Transmitted Output	-1999~9999	7.3
bA-A	bA-A	Zero Correcting Value of Re-Transmitted Output	-500-500	7.3
bAFi	bAFi	Full Scale Correcting Value of Re-Transmitted Output	0.500~1.500	7.3

★ bout (bout) —— Substitution Measured Value, when input signal trouble occurs.

When instrument judges that input signal is in trouble, the set bout value will be used to replace the former input signal, and will be used as the criterion of the alarm output and the value of Re-Transmitter Output.

6 Operations

6.1 Descriptions on Faceplate & Keys (take A-H model as an example)



Name		Remarks
Display Window	①Display Window of Measured Value	• Indication of Measured Values. • Indicating signs and values of Parameters in the Parameter Set Up Mode. • Decimal point of final digit is the recording designation.
② Indicator Lights		• Indication of alarm status at each Alarm-point.
Operational Keys	③the SET Key	• In Measuring Mode, hold down the key for more than 2 seconds to enter the Set Up Mode.

		• In Set Up Mode, hold down the key for more than 2 seconds, when displaying sign of parameters to enter the next group of parameters or return to the Measuring Mode. • In Set Up Mode, press the key once, when displaying sign of parameters to change the next parameter of the same group of parameters. • In Set Up Mode, press the key once, when displaying content of parameters to save the modified parameter.
	④the  Key	• No effect in Measuring Mode. • In Set Up Mode: ① Calling out the original parameter values; ②Moving the modified digit.

	⑤the  Key	• No effect in Measuring Mode. • Increase parameter values or change setting mode in Set Up Mode
	⑥the  Key	• No effect in Measuring Mode. • Decrease parameter values or change setting mode in Set Up Mode

6.2 Descriptions of Configuration Parameters Setting

The parameter of the instrument is divided into two groups. The group number of each parameter is listed in ***Parameter Tables*** in Chapter 5.

★ The parameters After oA in 1st group of parameters and The 2nd groups of parameters are controlled by Security Code. Access will be denied if Security Code is not set.

★ The parameters in front of oA in 1st group of parameters is controlled by Security Code can be selected through setting of oA1.

If the oA1 is OFF, the Security Code will be of no effect; if the oA1 is ON and the Security Code is not set, the data is accessible and modified but cannot be saved.

In the Set Up Mode and no key operation is carried out in 1 minute, the instrument will automatically quit the Set Up Mode.

6.3 Setting of Alarm Set Value

The Set Value of alarm in the 1st Group of parameters.

① Hold down the SET key for more than 2 seconds to enter the Set Up Mode, and the instrument indicates the Sign of the 1st parameter.

② Press the SET key once to select other parameters of this group in sequence.

③ Press the ◄ key to indicate the former

Setting value of current parameter. Flashing digit is the modifier digit.

④ Press the ◄ key to shift the modifier digit. By pressing the ▲ to increase, or ▼ to decrease, the desired parameter value can be assigned.

⑤ Press the SET key to save the modified parameter, and switch to the next parameter. If it is the last parameter of the group, press the SET key to return the first parameter of the group.

Repeat steps ② ~ ⑤ to set other parameters of the group.

★ If the modified parameter cannot be saved, that is because the oA1 is ON and the parameter is controlled by Security Code. The Security Code should be set first.

6.4 Setting of the Security Code

In Measuring Mode, the Security Code can be set by following.

① Hold down the SET key till AH is indicated.

② Press the SET key once till oA is indicated.

③ Press ◄ to enter the modifying status. Modify the value to 1111 by pressing ◄, ▲, ▼ keys.

④ Press the SET key to finish setting.

★ When the instrument is power-up or no key operation is performed for more than 1 minute, the Security Code will be automatically clean out.

6.5 Setting of Other Parameters

① First, set the Security Code following the steps in Chapter 6.4.

② After setting the Security Code, press the SET key to select The parameters after oA in 1st group of parameters.

③ Other groups of parameters: Hold down the SET key to enter each group. The instrument indicates the 1st actual parameter sign of the Group.

④ After setting to the group of the desired parameters, press the SET key to select the assigned parameters of the group in sequence circularly.

⑤ Press the ◄ key to indicate the former set value of the current parameter. Flashing digit is the modifier digit.

⑥ Press the ◄ key to shift the modifier digit. By pressing the ▲ key to increase, or ▼ key to decrease, the parameter can be modified to the desired value.

★ When symbolized parameter values are modified, the flashing digit should be final digit.

⑦ Press the SET key to save the modified parameter, and switch to the next one.

Repeat steps ④ ~ ⑦ to set other parameters of the group.

Quit Set Up Mode: When parameter signs are indicated, hold down the setting key SET to quit the Set Up Mode.

★ In the process of setting parameters, if no key operation is carried out for over 1 minute, instrument will automatically quit Set Up Mode.

7 Instructions on Functions & Parameters

7.1 Measurements & Displays

The process from sampling to indicating:

Sampling → Digital Filtering → Dimension Conversions → Calibrations → Indication

❗ Displays are affected by calibrations.

The following lists the relevant parameters of measurements and indications. Incorrect settings may result in false indications.

➢ InCH (incH) —— Input Signal Selection

Settings should correspond with instrument models and practical input signal. The parameter value is denoted in the form of sign. The following lists the corresponding relations:

No.	Signs	Input Signals
0	P100	Pt100
1	c100	cu100
2	cu50	cu50
3	bA1	BA1
4	bA2	BA2
5	G53	G53
6	___K	K
7	___S	S

No.	Signs	Input Signals
11	___E	E
12	___J	J
13	___t	T
14	4-20	4mA~20mA
15	0-10	0mA~10mA
16	0-20	0mA~20mA
17	1-5u	1V~5V
18	0-5u	0V~5V

8	---r	R
9	---b	b
10	---n	N

19	-10u	0V~10V

➢ in-d (in-d) —— Decimal Point Position Selection Indicated Measured Value

For RTD inputs: 000.0 is the only selection

For Thermocouple inputs: 0000 is the only selection

For other signal inputs: select according to requirements

➢ u-r (u-r) —— Lower Range

➢ F-r (F-r) —— Upper Range

The 2 parameters define the corresponding starting-point value and the end point value of indicated values of those input signals. For RTD and Thermocouple inputs, they have nothing to do with the 2 parameters and can be ignored.

Example: 4 mA~20mA input, corresponding to 0~1.600MPa, then set four above-mentioned parameters:

InPH = 4-20; in-d = 0.000

u-r = 0.000; F-r = 1.600

7.2 Alarm Output

Each Alarm Output has 3 parameters, which are used to set alarm values, select alarm types and set alarm hysteresis separately.

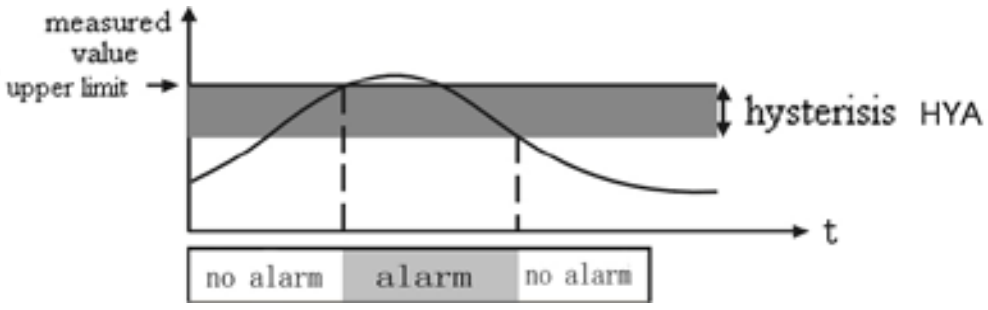
- The parameters AH, AL are Alarm Set Value of alarm outputs from the 1st to 2nd in sequence.
- The parameters AL o1 ~ AL o2 are alarm types of 2 alarm points in sequence.
- The parameters HYA1 ~ HYA2 are alarm hysteresis of the 1st to 2nd alarm output in sequence.
- Alarm Type: There are 2 alarm types

-HH-: Upper limit alarm, Alarm active when Measured Value > Alarm Set Value

-LL-: Lower limit alarm, Alarm active when Measured Value < Alarm Set Value

- Alarm Hysterisis: An extensional zone of Alarm clears can be set according to requirements, to avoid frequently act of Alarm Relay caused by Measured Value fluctuating around Alarm Set Value .

Example: When upper limit alarms:



7.3 Re-Transmitted Output

Re-Transmitted Output has 5 parameters:

- oP (op) —— Output signal selection

  When choose 4-20: Output is 4mA -20mA (or 1 V -5V)

  0- 10: Output is 0mA -10mA

  0-20: Output is 0mA -20mA (or 0 V -5V)

- bA-L (bA-L) —— Settings of lower range of Re-Transmitted Output

- bA-H (bA-H) —— Settings of upper range of Re-Transmitted Output

Example : For instruments with Thermocouple input which Re-Transmitted Output of 4mA-20mA correspond to 500-1200℃, settings should be oP = 4-20, bA-L = 500, bA-H = 1200.

- bA-A (bA-A) ——Re-Transmitted Output Zero Correction Value. The default setting is 0.

- bAFC (bA-A) ——Re-Transmitted Output Full Scale Correction Value. The default setting is 1.000.

8 Calibrations

Calibration can minish errors of zero and full range caused by sensors, transmitters and lead resistance, etc., and raises the measurement accuracy of the system. It can be actualized through Zero correction parameter and Full Scale correction parameter.

Zero correction should be done first when Calibration, and the Full Scale correction later.

➢ in-A (in-A) —— Zero Correction Value. The default setting is 0

Indicating Value = Indicating Value before Zero correction + in-A

➢ Fi (Fi) —— Full Scale Correction Value. The default setting is 1.000

Indicating Value = Indicating Value before Full Scale correction × Fi

For instruments with thermocouple input, calibration of Cold Junction Compensate accuracy can be done through LA parameter.

➢ LA (LA) —— Cold Junction Compensate Correction

The default setting is 0, compensate accuracy is ±0.5℃. Increasing value of this parameter can make compensated temperature increase; decreasing value of this parameter can make compensated temperature decrease.

★ If Cold Junction Compensate is not needed, this parameter can be set 99.

❗ If the input signal is short, the instrument will indicate the actual temperature of input terminal. Being affected by the heat of the instrument itself, the temperature may be higher than room temperature. In practical

applications, when compensating cable connected to the input terminal, the temperature of instrument itself is the Cold Junction temperature that is being measured. So the heat of the instrument will not affect the accuracy of measurements.

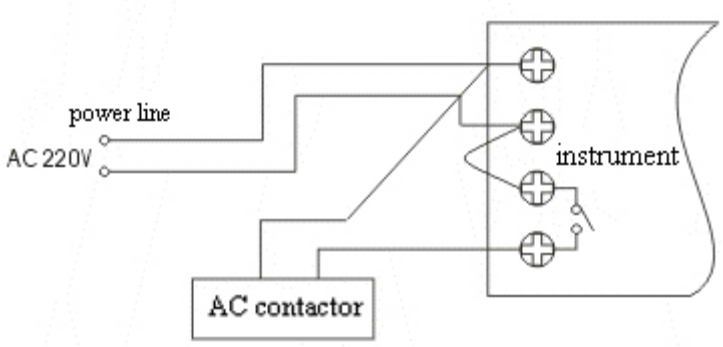
- FLtr (FLtr) —— Digital Filtering Time Constant

Used for overcoming fluctuation of the indicated values caused by signal too instability. The bigger the setting value is the greater the effect will be and the slower the reaction to the change of the input signal. The default setting is 1.

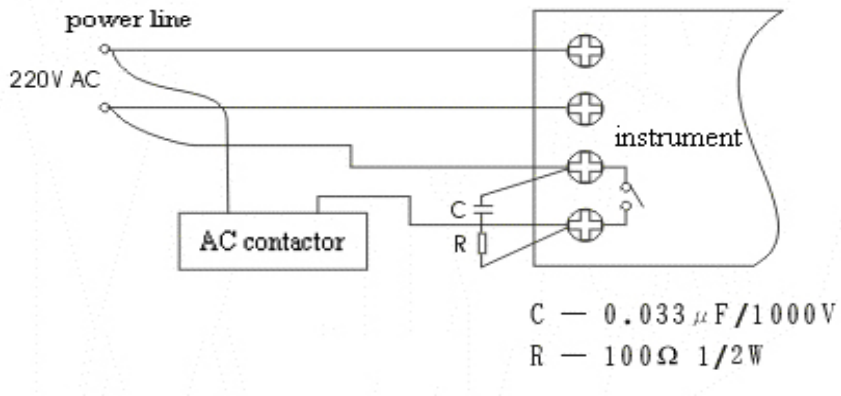
9 Anti-Interference Measures

When the instrument discovers some big fluctuation or pulsates, that is caused by too much noise, which can be reduced or eliminated by taking measures as following.

- The input signal cable should use shielded cable, whose shielding layer is grounding or connected with the input ground terminal of instrument, and should separated with power line with higher voltage of 100V as far as possible.
- Instrument's power supply should be separated with inductive load power supply (like AC contactor) as far as possible.



Wrong Connection



Correct Connection

- Parallel connect RC spark absorber circuit on the control contacts with inductive load.
- Properly setting of digital filtering time constant.