Version: 1100-110722

SHR Series

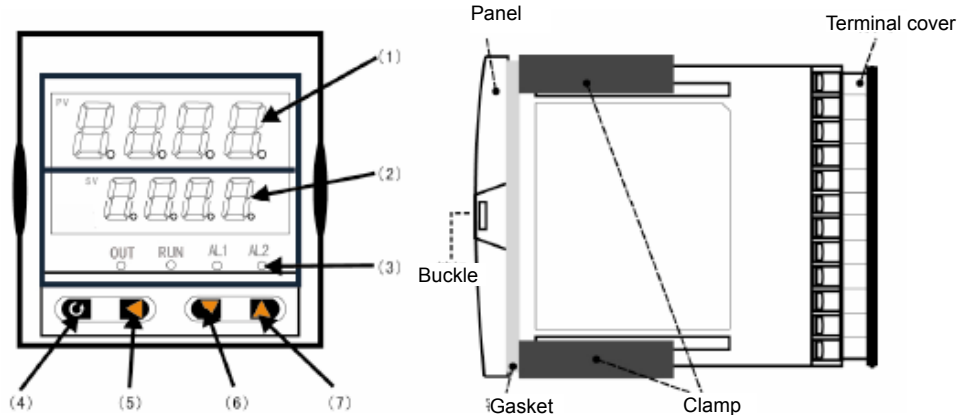
Operation Instruction of SHR-1100 (Simple) Single-Circuit Digital Display Controller

Introduction

SHR-1100 (simple) single-circuit digital display controller provides easy operation with measurement precision of 0.3%; 7 types of dimensions available; double four-digit LED display, supporting thermocouple, thermal resistance, voltage (extraction operation available), current (extraction operation available), and transducer input; applicable to measurement of industrial process quantifiers including temperature, pressure, flow, liquid level, and humidity etc. Supporting 2-way alarm, 1-way control output or RS485 communication interface adopting standard MODBUS protocol, 1-way DC24V feed output; photoelectric isolation between input, output and power end; 100-240V AC/DC or 20-29V DC switch power supply; standard snap-in installation; operating temperature: 0-50℃, relative humidity: 5-85% RH without coagulation.

1. Profile of Display Panel

(1) PV Display (measured value)



(2) SV Display

Display parameters like input type in measurement mode;

Display setting value in parameters setting mode;

(3) Primary alarm (AL1) and secondary alarm indication lamp, running lamp (RUN) and output lamp (OUT);

(4) Confirmation

(5) Shift

(6) Decrease

(7) Increase

How to get the core out of shell

The core of instrument can be taken out from the shell. Push buckles on both sides of the front panel aside, and push the front panel to separate core and shell. For installation, put the core into the

shell and lock it with buckles to meet protection standard.

2. Model Selection

①Specification	
Code	Width×height×depth
A	160x80x110mm (horizontal)
B	80x160x110mm (vertical)
C	96x96x110mm (square)
D	96x48x110mm (horizontal)
E	48x96x110mm (vertical)
F	72x72x110mm (square)
H	48x48x110mm (square)
③Output (OUT)	
Code	Output type (load resistance RL)
X	No output
0	4-20mA (RL≤600Ω)
1	1-5V (RL≥250KΩ)
2	0-10mA (RL≤1.2KΩ)
3	0-5V (RL≥250KΩ)
4	0-20mA (RL≤600Ω)
5	0-10V (RL≥4KΩ)
D1	RS-485 communication interface (Modbus)
④Alarm (relay contact output)	
Code	Limits for alarm
X	No output
1	1-limit alarm
2	2-limit alarm
⑤Feed output	
Code	Voltage range
X	No output
P	Feed output (load current≤30mA)
	For example, "P(24)" means feed output 24V
⑥Power supply	
Code	Voltage range
A	AC/DC100~240 (AC/50-60hz)
D	DC20~29
⑦Remarks	
N/A, omissible	

②Input graduation	
No.	Graduation (measurement range)
00	Thermocouple B (400~1800℃)
01	Thermocouple S (0~1600℃)
02	Thermocouple K (0~1300℃)
03	Thermocouple E graduation (0~1000℃)
04	Thermocouple Tgraduation (-200.0~400.0℃)
05	Thermocouple J graduation (0~1200℃)
06	Thermocouple R graduation (0~1600℃)
07	Thermocouple N graduation (0~1300℃)
08	Thermocouple F2 graduation (700~2000℃)
09	Thermocouple Wre3-25 graduation (0~2300℃)
10	Thermocouple Wre5-26 graduation (0~2300℃)
11	Thermal resistance Cu50 (-50.0~150.0℃)
12	Thermal resistance Cu53 (-50.0~150.0℃)
13	Thermal resistance Cu100 (-50.0~150.0℃)
14	Thermal resistance Pt100 (-200.0~650.0℃)
15	Thermal resistance BA1 (-200.0~600.0℃)
16	Thermal resistance BA2 (-200.0~600.0℃)
17	Linear resistance 0~500Ω (-1999~9999)
18	Remote transmission resistance 0~350Ω (-1999~9999)
19	Remote transmission resistance 30~350Ω (-1999~9999)
20	0~20mV (-1999~9999)
21	0~40mV (-1999~9999)
22	0~100mV (-1999~9999)
23	Reserved internally
24	Reserved internally
25	0~20mA (-1999~9999)
26	0~10mA (-1999~9999)
27	4~20mA (-1999~9999)
28	0~5V (-1999~9999)
29	0~5V (-1999~9999)
30	Reserved internally
31	0~10V (-1999~9999)
32	0~10mA (extraction) (-1999~9999)
33	4~20mA (extraction) (-1999~9999)
34	0~5V (extraction) (-1999~9999)
35	1~5V (extraction) (-1999~9999)
55	Full switch

Notes:

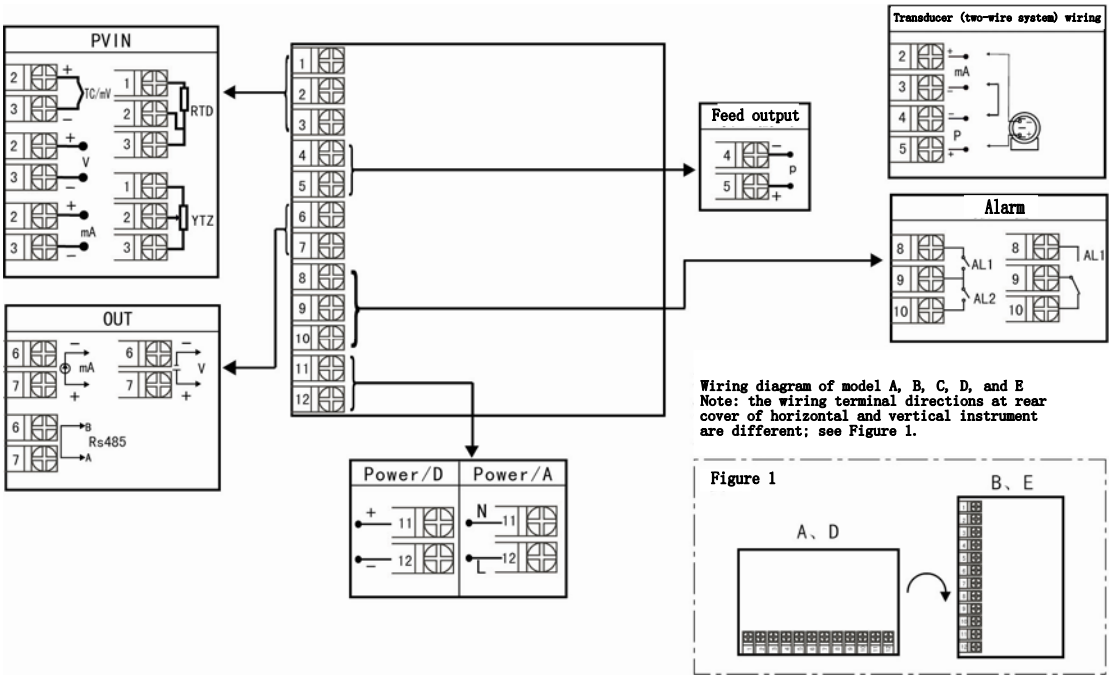
Contact capacity of 1st relay (with normally open/closed contact): AC220V/3A, DC30V/5A

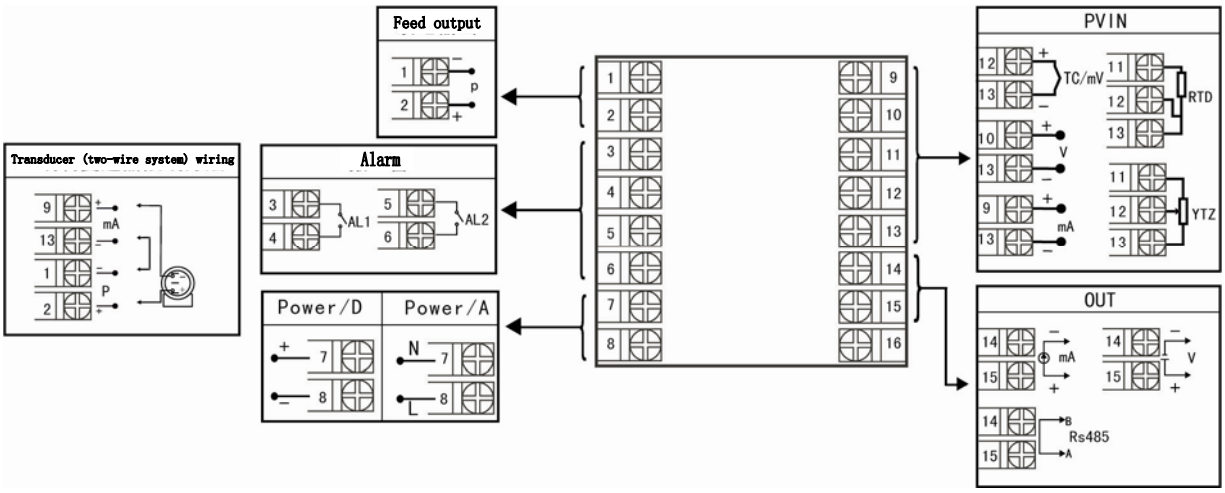
(resistive load)

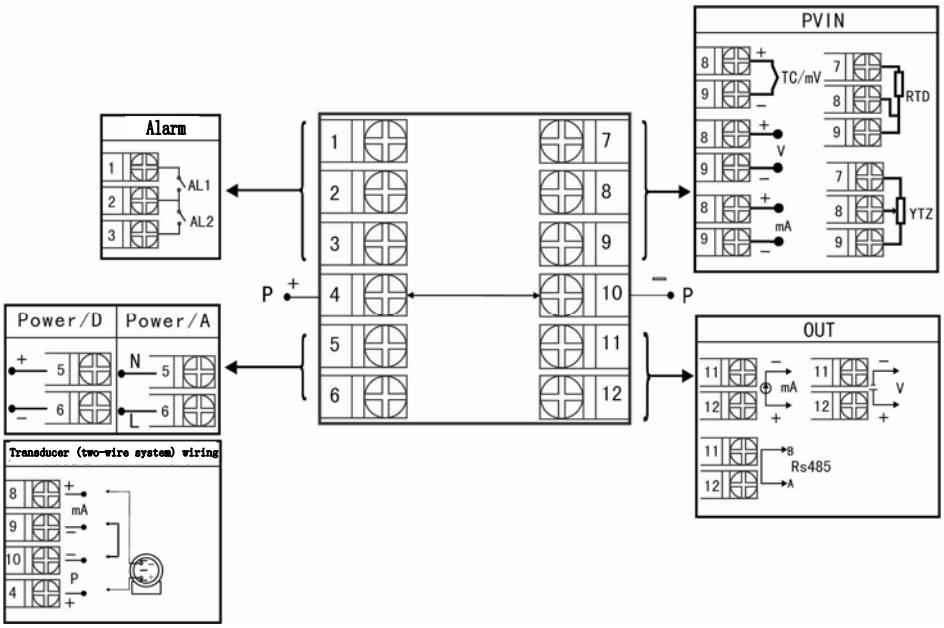
Contact capacity of 2nd relay (only one normally open contact):AC220V/3A, DC30V/5A (resistive load)

Contact capacity of relay for instrument of Model H: AC220V/0.6A, DC30V/0.6A (resistive load)

3. Wiring







Note: in the above diagram, if one group of terminals has different functions, only one of them may be available. Take RS485 for example, communication and transducing output are on the same group of OUT terminals, so only one of them may be selected.

See figure below for short circuit ring corresponding to input signal of Model A, B, C, D, E, and H.

	JP1	JP2
Thermal resistance input Thermocouple input	 mV/R/mA V	 mV/R mA
DC current input	 mV/R/mA V	 mV/R mA
DC voltage input	 mV/R/mA V	

4. Operation

After power-on self-test, the instrument will enter operating mode automatically. Press for parameters setting.

(1) Press and hold for reset;

(2) In any other menu, press and hold for 5 seconds to go back to measurement menu;

★ Back to operating mode

(1) Manual return: in parameters setting mode, hold for 5 seconds to return to real-time measurement mode;

(2) Automatic return: in parameters setting mode, inaction for 60 seconds will bring the instrument

back to real-time measurement mode.

4.1 L1 Parameters Setting

In the operating mode, press , PV will display LOC and SV will display parameter symbol: press increase/decrease key for setting.

See table below for L1 parameters (matching functions of the ordered model; there will not be parameters for functions not available):

Parameter	Symbol	Name	Setting Range (Value)	Description	Preset value
LoC	LoC	Parameter lock	LoC=00 LoC≠ 00.132 LoC=132	No lock (valid for change of L1 parameters) Lock (valid for change of L1 parameters) No lock (valid for change of L1 and L2 parameters)	00
AL1	AL1	Primary alarm value	-1999-9999	Setting value for primary alarm	50 or 50.0
AL2	AL2	Secondary alarm value	-1999-9999	Setting value for secondary alarm	50 or 50.0
AH1	AH1	Return difference of primary alarm	0-9999	Return difference value of primary alarm	02 or 2.0
AH2	AH2	Return difference of secondary alarm	0-9999	Return difference value of secondary alarm	02 or 2.0
SdiS	SdiS	SV display screen content in measurement mode	SdiS=0 SdiS=1 SdiS=2 SdiS=3 SdiS=4 SdiS=6 SdiS=7	Input graduation Primary alarm value Secondary alarm value No content No content ℃ No content	0

4.2 L2 Parameters Setting

In the operating mode, press , PV will display LOC and SV will display parameter symbol: press increase/decrease key for setting. Loc=132 and hold to enter L2 parameters interface.

See table below for L2 parameters (matching functions of the ordered model; there will not be parameters for functions not available):

Parameter	Symbol	Name	Setting Range (Value)	Description	Preset value
Pn	Pn	Input graduation	0~35	Set input graduation type (see L2 Parameters Pn Lookup Table)	
dP	Dp	Decimal point	dp=0 dp=1	No decimal point Ten decimal places (XXX.X)	

			dp=2 dp=3	One hundred decimal places (XX.XX) One thousand decimal places (X.XXX)	
AL1	ALM1	Primary alarm mode	ALM1=0 ALM1=1 ALM1=2	No alarm Lower-limit alarm Upper-limit alarm	
AL2	ALM2	Secondary alarm mode	ALM2=0 ALM2=1 ALM2=2	No alarm Lower-limit alarm Upper-limit alarm	
FK	FK	Filter coefficient	0-4	To prevent flopping of displayed value	
Addr	Addr	Equipment code	0-250	Setting of equipment code of the instrument in communication	
bAUd	Baud	Baud rate	1200 2400 4800 9600	Baud rate: 1200bps Baud rate: 2400bps Baud rate: 4800bps Baud rate: 9600bps	
Pb	PB	Display input zero shift	Full range	Set and display shift of input zero	
PK	PK	Display input range scale	0-1.999 times	Set and display amplification scale of input range	
ouL	OuL	Lower limit of measurement range of transducing output	Full range	Set lower limit of measurement range of transducing output	
ouH	ouH	Upper limit of measurement range of transducing output	Full range	Set upper limit of measurement range of transducing output	
PL	PL	Lower limit of measurement range	Full range	Set lower limit of measurement range of input signal	
PH	PH	Upper limit of measurement range	Full range	Set upper limit of measurement range of input signal	
Cut	Cut	Small measuring signal cutting	0.000-1.000	This function only works for voltage/current extraction signal; when input signal<lower limit of input signal+(upper limit of input signal-lower limit of input signal>*set percentage, the instrument displays	

				lower limit of measurement range.			
out	Out	Transducing output type	Signal type	Parameter symbol	Signal type	Parameter symbol	
			0-20mA	20mA	0-5V	0-5V	
			0-10mA	10mA	1-5V	1-5V	
			4-20mA	4-20	No output	0mA	
r-Pb	T-Pb	Zero correction at cold junction	Full range	Set zero correction value at cold junction			
r-PE	T-Pk	Gain correction at cold junction	0-1.999 times	Set gain correction value at cold junction			

L2 Parameters Pn Lookup Table

Code	Symbol Type	Parameter Symbol	Range Scope
0	Thermocouple B	T--B	400-1800℃
1	Thermocouple S	T--S	0-1600℃
2	Thermocouple K	T--K	0-1300℃
3	Thermocouple E	T--E	0-1000℃
4	Thermocouple T	T--T	-200.0-400.0℃
5	Thermocouple J	T--J	0-1200℃
6	Thermocouple R	T--R	0-1600℃
7	Thermocouple N	T--N	0-1300℃
8	F2 graduation	T-F2	700-2000℃
9	Wre3-25 graduation	T-L3	0-2300℃
10	Wre5-26 graduation	T-L5	0-2300℃
11	Thermal resistance Cu50	Cu50	-50.0-150.0℃
12	Thermal resistance Cu53	Cu53	-50.0-150.0℃
13	Thermal resistance Cu100	C100	-50.0-150.0℃
14	Thermal resistance Pt100	P100	-200.0-650.0℃
15	Thermal resistance BA1	BA1	-200.0-600.0℃
16	Thermal resistance BA2	BA2	-200.0-600.0℃
17	0-500Ω linear resistance	RO.5K	0-500Ωlinear resistance

18	0-350Ω remote transmission resistance	0350	Full range
19	30-350Ω remote transmission resistance	3350	Full range
20	0-20mV	20MV	Full range
21	0-40mV	40MV	Full range
22	0-100mV	100MV	Full range
25	0-20mV	20MV	Full range
26	0-10mV	10MV	Full range
27	4-20mV	4-20	Full range
28	0-5V	0-5V	Full range
29	1-5V	1-5V	Full range
31	0-10V	10V	Full range
32	0-10mA extraction	1.0MA	Full range
33	4-20mA extraction	4.-20	Full range
34	0-5V extraction	0.-5V	Full range
35	1-5V extraction	1.-5V	Full range
55	Full switch		

Note: how to fast switch graduation: change L2 parameter Pn; move decimal place to 1000 or 100, press increase/decrease key to switch first place and last place of graduation; when the decimal point is at 10, switch graduation at unit of ten; when the decimal point is at unit place, switch graduation at unit of one.

5. Digital Communication

Digital communication allows communication between the instrument and PC/PC network. MODBUS RTU protocol has been adopted. Please visit www.modbus.org for information about the protocol. It's not suggested to non-separated interface board, as it may cause disturbance or influence communication for earth potential difference. Shielded twisted pair shall be used as the lead.

★ Refer to "Instrument Communication Manual" for specific parameters.

This Operation Instruction will be subject to any change without notice.