

**DFQA7000 Reserve Manual Controller
With Engineering Variable Input**

Operating Instruction

Contents

1. Application.....	1
2. Technique Features.....	1
3. Ordering Number.....	1
4. Input Signal Setting.....	2
5. Trouble and Accessories.....	3
6. Installation and Wiring.....	4
7. Panel Indication.....	5
8. Operation Diagram.....	6
9. Menu Explain.....	7
10. Special Declare.....	9

1. Application

DFQA7000 is a reserve manual controller. It is using in series of the output channel of the PID or PLC or DCS controller, to realize the no disturbance changing between the PID or PLC or DCS system auto control mode and DFQA7000 manual control mode.

DFQA7000 has two AI inputs. The IN1 is valve position command signal input that comes from the PID control output. The IN2 is the engineering signal input.

DFQA7000 has two AO outputs. The OUT1 is valve position command output. The OUT2 is the engineering signal transmitter output.

DFQA7000 has four DI inputs. The DI1 is force manual control input, that is usually connected to the fail state output of the former PLC or DCS or PID controller. The DI2 is remote manual control input. The DI3 is remote manual open valve command input. The DI4 is remote manual close valve command input. The DI3 and DI4 are effective only as the DI1 or DI2 is effective.

DFQA7000 has one DO output. That is DFQA7000 manual control mode output.

DFQA7000 has a RS485 communication port. It can communicate with the upper computer.

When DFQA7000 works in automation control mode, Its OUT1 is equal to the IN1 in percent ratio.

When DFQA7000 works in manual control mode, Its OUT1 is not equal to the IN1, but it is setting by panel keys “Δ” and “▽”.

The OUT2 is always equal to the IN2 whether in auto control mode or in manual control mode.

2. Technique features

Environment condition: temperature 0~50℃ relative humidity ≤90%

Power supply: 80VAC~260VAC, 50Hz ~60Hz, Power consumption: 4~10W

Accuracy: 0.5%FS+1 digital, Resolution: 1 digital

Outline dimension: 80×160×150mm 160×80×150mm 96×96×112mm

Panel cut-out dimension: $152^{+1.00} \times 76^{+0.74}$ mm $92^{+1.00} \times 92^{+1.00}$ mm

Weights: about 0.5Kg, structure: plug in

3. Ordering number

Ordering number					Explain
DFQA					Intelligent reserve manual controller with engineering signal input
Series	7				Electrical transformer power supply
Valve position command input		5			Suitable for DC 0~10mA signal input
		6			Suitable for DC 4~20mA signal input
		7			Suitable for DC 0~5V signal input
		8			Suitable for DC 1~5V signal input
Valve position command output		5			0~10mA Control output
		6			4~20mA Control output
		7			0~5V Control output
		8			1~5V Control output
Engineering signal input		1			Suitable for TC signal input
		2			Suitable for RTD signal input
		3			Suitable for mV signal input
		4			Suitable for remote pressure gauge input
		5			Suitable for DC 0~10mA signal input
		6			Suitable for DC 4~20mA signal input
		7			Suitable for DC 0~5V signal input
		8			Suitable for DC 1~5V signal input
		9			Special sensor input as order
Engineering signal transmitter output		5			0~10mA Transmitter output
		6			4~20mA Transmitter output
		7			0~5V Transmitter output
		8			1~5V Transmitter output
Outline type			V		80×160×150mm Upright type
			F		96×96×112mm Square type
			GV		80×160×150mm LED bar upright type
Power supply					AC220V
			D		DC24V
Communication port					Without communication port
				RS232	With RS232 isolation port
				RS485	With RS485 isolation port

4. Input signal setting

4.1 Standard input table

- Linear input and measurement range

Input type		Display symbol	Resolution	Measurement range	Suitable sensor
Standard linear input	Linearity		10 μ A	-1999~9999	0-10mA input
	Linearity		10 μ A	-1999~9999	4-20mA input
	Linearity		1mV	-1999~9999	0-5V input
	Linearity		1mV	-1999~9999	1-5V input
Un-standard linear input			1mV	-1999~9999	Any input within 0-5V
Any input within 0-5V			1mV	-1999~9999	Any input within 0-5V

- RTD input and measurement range

Input type	Display symbol	Resolution	Measurement range	Suitable sensor
Pt100		1 $^{\circ}$ C	-200~600 $^{\circ}$ C	Platinum R0=100 Ω
Pt100.0		0.1 $^{\circ}$ C	-199.9~200.0 $^{\circ}$ C	Platinum R0=100.0 Ω
Pt10		1 $^{\circ}$ C	-200~850 $^{\circ}$ C	Platinum R0=10 Ω
Cu100		0.1 $^{\circ}$ C	-50.0~150.0 $^{\circ}$ C	Copper R0=100 Ω
Cu50		0.1 $^{\circ}$ C	-50.0~150.0 $^{\circ}$ C	Copper R0=50 Ω
30~350 Ω		0.1 Ω	User setting	Pressure gauge 30-350 Ω

- TC input and measurement range

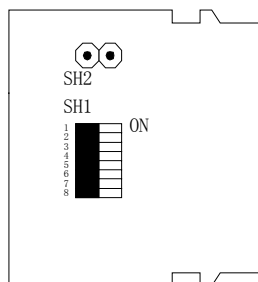
Input type	Display symbol	Resolution	Measurement range	Suitable sensor
B		1 $^{\circ}$ C	700~1800 $^{\circ}$ C	TC type: B
R		1 $^{\circ}$ C	0~1760 $^{\circ}$ C	TC type: R
S		1 $^{\circ}$ C	0~1600 $^{\circ}$ C	TC type: S
N		1 $^{\circ}$ C	0~1400 $^{\circ}$ C	TC type: N
K		1 $^{\circ}$ C	0~1300 $^{\circ}$ C	TC type: K
E		1 $^{\circ}$ C	0~800 $^{\circ}$ C	TC type: E
J		1 $^{\circ}$ C	0~600 $^{\circ}$ C	TC type: J
T		1 $^{\circ}$ C	-200~400 $^{\circ}$ C	TC type: T
Un-standard mV signal		0.01 mV	-1999 ~9999	Any input within 0~ 60mV

Note: Any input had been calibrated in production, and need not to calibrate again by user. The user had only to change the key setting and the input switch in PCB board

4.2 Input signal type key setting

According to the range setting menu.

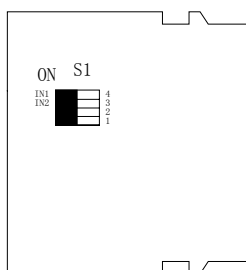
4.3 Input PCB jumper setting



80×160×150mm
Input jumper

Input	0-5/ 1-5 V	0-10/ 4-20mA	RTD	TC
Jumper setting				
SH2			No	No
SH1				

Jumper setting



96×96×110mm
Input pcb jumper

Input		0-5V/ 1-5 V	0-10/ 4-20 mA
Jumper setting	IN1	ON S1 	ON S1
	IN2	ON S1 	ON S1

Jumper setting

5. Trouble and accessories

5.1 Trouble eliminate

Trouble		Cause	Eliminate method
Not lighting		Power fail	Check the power
		Power terminal fail	Take out the device core and check the power terminal
		Device go wrong	Contact to the distribute or manufacture
LED display		Input type setting wrong	Check the input type setting
		Input signal overflow	Check the input signal
		Input signal line break	Check the input signal wire
		Input type wrong	Check the input type setting
		Input signal overflow	Check input signal
		Calibration wrong	Calibration the input again
LED display		Input type wrong	Check input type setting
		Input signal under -range	Check input signal
		Calibration wrong	Calibration the input again
Display wrong		Input type wrong	Check the input type setting
		Correction menu setting wrong	Check the correction setting menu
		Input wire wrong	Check the input wire
		Input signal wrong	Check the input signal
Can not enter the corresponding menu		Device type wrong	Contact to the distribute or manufacture
		The menu be locked	Unlock the menu
Can't unlock the menu		Have not the menu	Contact to the distribute or manufacture
		Lose the unlock code	Contact to the distribute or manufacture
Display change suddenly		Electro-magnetic contactor spark influence	Remove the spark with a spark absorber
		Signal disturbance too strong	Depart the input signal cable from the power line
		Power disturbance too strong	Depart the device power from the power motor/transducer.
		Field cable confusion	VDC load connect a parallel reverse diode
			Signal cable depart from power cable
			Using shield signal cable, the shield connect to the earth
		Power pollution	Depart the device power supply from other power supply
			Depart the device power from the SCR device/transducer
		Add a on line power supply	
Power unit fail		Power supply wrong	Check the power supply cleaner
Relay action wrong		Power supply pollution	Instead of a independent power supply ; add a power supply cleaner
		Contactor spark influence	Add a spark absorber to the AC contactor Add a parallel reverse diode to the DC load

5.2 Overcoming the severe field disturbance

If the field disturbance is severe and method listing in table 4.1 is of no effect, please add an EMC-filter to the power, to the input, to the relay output

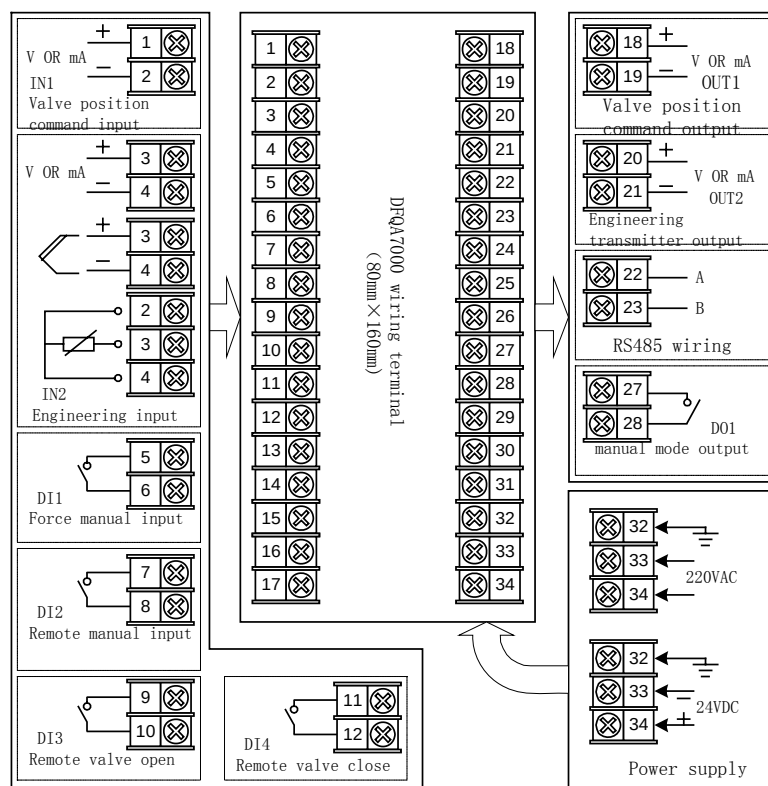
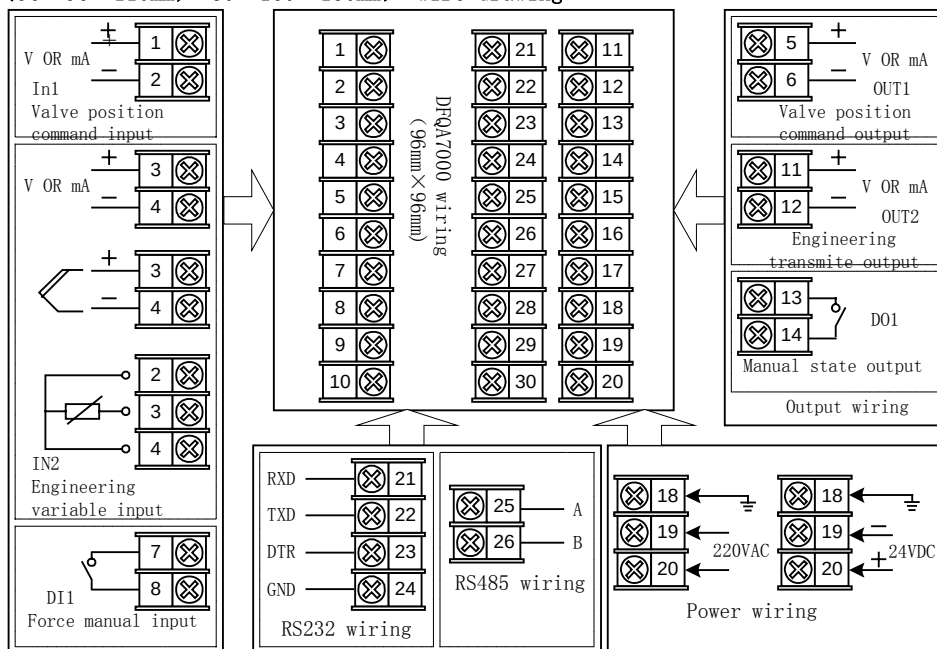
5.3 Accessories

- An operation instruction
- A QC certificate

6. Installation and wiring

- Signal cable should depart from the power supply, and must be the shield cable, and the shield must be connected to the signal earth, to avoid the signal influence
- The device power should be an independent power, a cleaning power, and should not be connected to other polluted power.

6.1 DFQA7000 (96×96×110mm, 80×160×150mm) wire drawing



Notes: If there is difference between operation instruction and meter case back wiring, the case back wiring is the right.

7. Panel indication

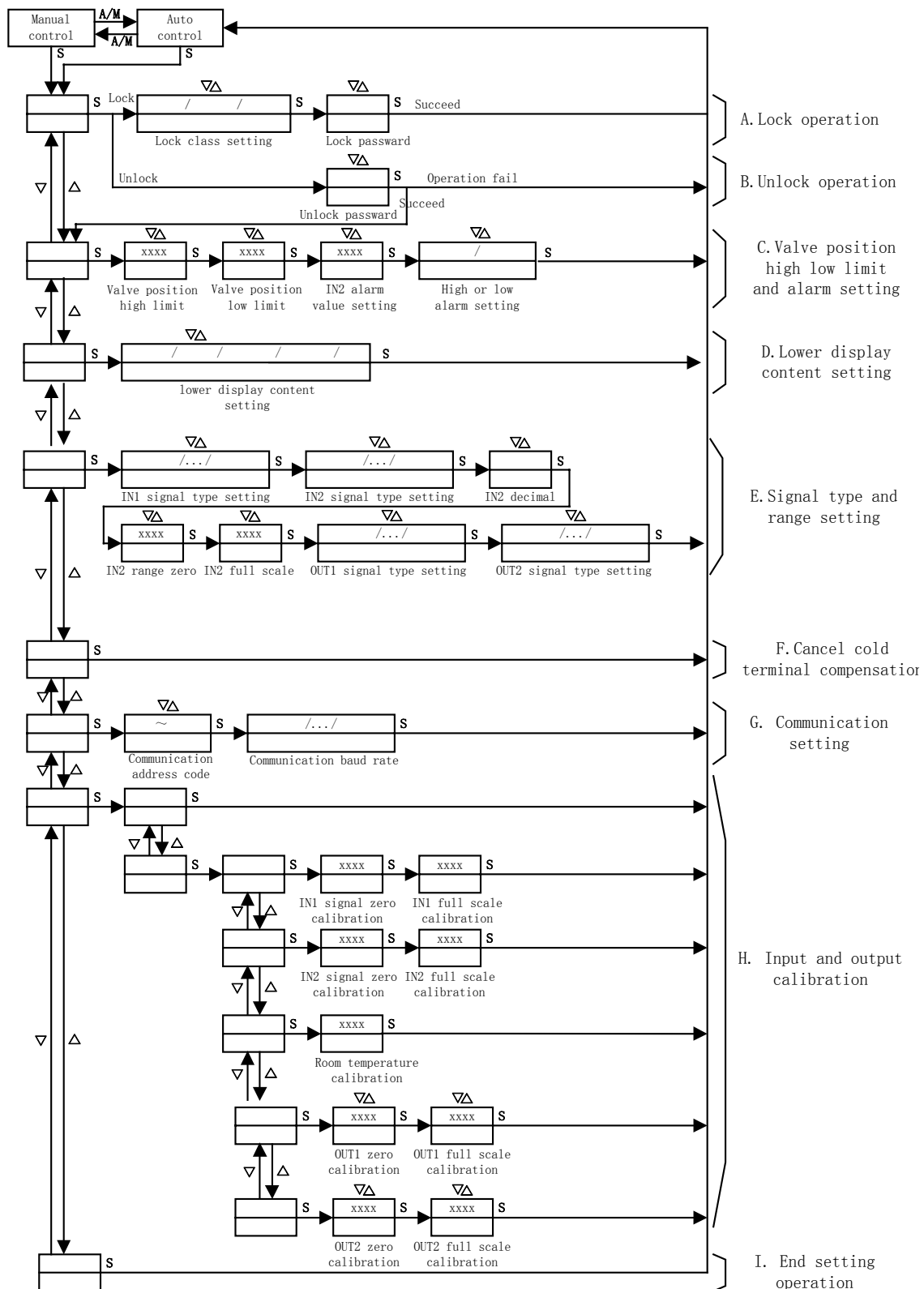


Outline (mm): 80×160×150 80×160×150 96×96×110
Panel cutoff (mm): 76^{+0.74}×152^{+1.00} 92^{+0.87}×92^{+0.87} 76^{+0.74}×152^{+1.00}

Panel message		Content
Display	Upper display	● In working state, it indicate valve position command output ● In parameter setting mode, it indicate parameter name or parameter value
	Lower display	● In working state, it indicate engineering input (IN2) ● In parameter setting mode, it indicate parameter name
Key	▽	● In manual control mode, press it to close the valve ● In parameter setting, press it to decrease parameter value
	SET	● In working mode, press it to enter setting mode ● In setting mode, press it to confirm the setting
	△	● In manual control mode, press it to open the valve ● In setting mode, press it to increase the parameter value
	A/M	● Press it to change between auto control and manual control mode
LED lamp	MAN	● In manual control mode, it lights
	ALARM	● If the alarm is active, it lights

8. Operation diagram

- Notes: ① It will return to working mode, if keep no operation for 40 seconds; ② If the menu can not be seen, the menu may be locked or have not the function
- Symbol explain: The symbol ▽, S, △ in the draw means press key ▽ or SET or △, the contents in the pane is LED display message



9. Menu explain

A. Lock operation

B. Unlock operation

Menu and operation	Factory setting	Explain
- Entry of the lock unlock menu group - Press key SET to confirm - Press key Δ、▽ to exit		Entry of the lock unlock menu group
/ / - Lock class setting - Press key Δ、▽ to modify - Press key SET to confirm		: Lock all menu : Lock all menu beside SP and parameter : Lock only the calibration menu
- Lock password setting - Press key Δ、▽ to modify - Press key SET to confirm		Lock password setting Note: "00" is invalid password
- Unlock password setting - Press key Δ、▽ to modify - Press key SET to confirm		Unlock password setting

C. Valve position limit and alarm setting

Manu and operation	Factory setting	Explain
- Entry of the valve position limit and alarm menu group - Press key SET to confirm - Press key Δ、▽ to exit		Entry of the valve position limit and alarm menu group
XXXX - OUT1 high limit setting - Press key Δ、▽ to modify - Press key SET to confirm		OUT1 high limit setting
XXXX - OUT1 low limit setting - Press key Δ、▽ to modify - Press key SET to confirm		OUT1 low limit setting
XXXX - IN2 alarm value setting - Press key Δ、▽ to modify - Press key SET to confirm	.	IN2 alarm value setting
/ - High or low alarm selection - Press key Δ、▽ to modify - Press key SET to confirm		High or low alarm selection : low alarm : high alarm

D. Lower display content setting

Manu and operation	Factory setting	Explain
- Entry of the lower display menu group - Press key SET to confirm - Press key Δ、▽ to exit		Entry of the lower display menu group
/.../ - Lower display content setting - Press key Δ、▽ to modify - Press key SET to confirm		: Engineering input : Alarm valve : OUT1 : OUT2 : Room temperature

E. Input and output signal type and measurement range setting

Manu and operation	Factory setting	Explain
- Entry of the signal type and range menu group - Press key SET to confirm - Press key Δ、▽ to exit		Entry of the signal type and range menu group

Manu and operation		Factory setting	Explain
...	- IN1 signal type selection - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	IN1 signal type selection
...	- IN2 signal type selection - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	IN2 signal type selection
	- IN2 decimal setting - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	IN2 decimal setting
xxxx	- IN2 range zero setting - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	IN2 range zero setting
xxxx	- IN2 range full scale setting - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	IN2 range full scale setting
...	- OUT1signal type setting - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	OUT1signal type setting
...	- OUT2 signal type setting - Press key Δ, ∇ to modify - Press key SET to confirm	As ordering	OUT2 signal type setting

F. Cancel the thermo couple cold terminal compensation

Menu and operation		Factory setting	Explain
	- Cancel thermo couple cold terminal compensation - Press key SET to confirm - Press key Δ, ∇ to exit - After turn off and turn on the power again, the cold terminal compensation function will be recovered		Cancel thermo couple cold terminal compensation Compensation area: 0~50℃ After turn off and turn on the power again, the cold terminal compensation function will be recovered

G. Communication setting

Menu and operation		Factory setting	Explain
	- Entry of the communication menu group - Press key Δ, ∇ to exit - Press key SET to confirm		Entry of the communication menu group
~	- Communication address setting - Press key Δ, ∇ to modify - Press key SET to confirm		Communication address setting: ~
...	- Communication baud rate setting - Press key Δ, ∇ to modify - Press key SET to confirm		:1200bps; :2400bps; :4800bps; :9600bps

H. Input and output calibration

When in input calibration, it is necessary to input a zero or full scale signal to the input terminal. When in output calibration it is also necessary to connect a supervision meter to the output terminal.

Menu and operation		Explain
	- Entry of the calibration menu group - Press key SET to confirm - Press key Δ, ∇ to exit	Entry of the calibration menu group
/	- Sure or not to enter the calibration menu? - Press key SET to confirm - Press key Δ, ∇ to modify	: exit : enter
	- Entry of IN1 calibration menu group - Press key SET to confirm - Press key Δ, ∇ to exit	Entry of IN1 calibration menu group

Menu and operation		Explain
XXXX	- IN1 signal zero calibration - Input a constant zero signal to the IN1 terminal for 10 seconds, then press key SET to confirm	0.00mA or 0.000V
XXXX	- IN1 full scale signal calibration - Input a constant Full scale signal to the IN1 terminal for 10 seconds, then press key SET to confirm	20.00mA or 5.00V
	- Entry of the In2 menu group - Press key SET to confirm - Press key Δ、∇ to exit	Entry of the In2 menu group
XXXX	- IN2 signal zero calibration - Input a constant zero signal to the IN2 terminal for 10 seconds, then press key SET to confirm	0.00mA or 0.000V
XXXX	- IN2 signal full scale calibration - Input a constant Full scale signal to the IN2 terminal for 10 seconds, then press key SET to confirm	20.00mA or 5.000V
	- Entry of the room temperature calibration menu - Press key SET to confirm - Press key Δ、∇ to exit	Entry of the room temperature calibration menu
XXXX	- Room temperature calibration - Press key Δ、∇ to input actual room temperature, then press key SET to confirm	Room temperature calibration
	- Entry of OUT1 calibration menu group - Press key SET to confirm - Press key Δ、∇ to exit	Entry of OUT1 Calibration menu group
XXXX	- OUT1 zero calibration - Press key Δ、∇ to modify (supervision with an external meter) - Press key SET to confirm	Zero signal is: 4.00mA or 1.000V
XXXX	- OUT1 signal full scale calibration - Press key Δ、∇ to modify (supervision with an external meter) - Press key SET to confirm	Full scale signal is: 20.00mA or 5.000V
	- Entry of OUT2 calibration menu group - Press key SET to confirm - Press key Δ、∇ to exit	Entry of OUT2 calibration menu group
XXXX	- OUT2 zero calibration - Press key Δ、∇ to modify (supervision with an external meter) - Press key SET to confirm	Zero signal is: 4.00mA or 1.000V
XXXX	- OUT2 full scale calibration - Press key Δ、∇ to modify (supervision with an external meter) - Press key SET to confirm	Full scale signal is: 20.00mA or 5.000V

I. End parameter setting

Menu and operation		Explain
	- End parameter setting - Press key SET to confirm - Press key Δ、∇ to exit	End parameter setting