

1. Main features

- High-value, super-large display with new, high-brightness LED segments, designed to enhance visibility from all angles and at long distances.
- Economically designed for easy operation and practical functionality, specially tailored for temperature control.
- PID control output features dual-type outputs of Relay and SSR; the output from either Relay or SSR can be selected through system parameters.
- Supports common TC and RTD input types, selectable via software parameters.
- Achieves measurement accuracy at the 0.25% level. Measurement errors caused by temperature drift and time drift are minimized through digital correction and self-calibration technologies.
- Features an advanced "FUZZY+PID" AI intelligent control mode, preventing overshoot and including auto-tuning (AT) and self-adaptation functions.
- Provides up to two-way alarm outputs and supports various alarm methods.
- Allows selection between °C and °F for temperature units via software parameters.
- High-efficiency and high-reliability switching power supply, compatible with a global universal voltage range of AC100~240V or DC12~24V.
- The anti-interference performance meets the requirements for electromagnetic compatibility (EMC) in harsh industrial conditions.

2. Technical Specification

Panel type	G	D	A	E	F
Panel size mm (width × height)	48×48	72×72	96×96	48×96	96×48
Hole size mm (width × height)	45 ^{+0.6} × 45 ^{+0.6}	68 ^{+0.6} × 68 ^{+0.6}	92 ^{+0.6} × 92 ^{+0.6}	45 ^{+0.6} × 92 ^{+0.6}	92 ^{+0.6} × 45 ^{+0.6}
Power supply voltage	AC100~240V 50/60Hz or DC12~24V				
Range of allowable voltage variation	85% ~ 110% of rated supply voltage				
Power consumption	About at AC100 ~ 240V 5VA and DC12~24V 3W				
Display mode	7-segment negative LED liquid crystal display, PV White SV green light indicator orange light				
Input specifications and measuring range	TC Thermocouple: K (-50~ 1300°C), E (0~800°C), J (0~1000°C), N (0~1300°C) RTD Thermal resistance: Pt100 (-200~ 600°C)				
The number of decimal places	0(None) , 0.0(1 decimal point) Set by dp parameter				
Measurement accuracy	Accuracy is at grade 0.25 when thermal resistance and thermocouples are used as inputs, with cold-end compensation provided by copper resistance or the freezing point. Accuracy is 0.25% FS ± 2.0°C when the input is from a thermocouple with cold-end compensation handled by the internal components of the instrument.				
Sampling period	80ms (when digital filter parameter INF = 0) , display response time ≤0.5 seconds				
Control mode	ON/OFF bit adjustment, PID + FUZZY artificial intelligence adjustment algorithm				
Contact output	Relay+SSR Dual type output Relay:5A/250VAC Resistive Load, 5A/30VDC resistive load SSR:12VDC/50mA (Drive external solid state relay)				
Electromagnetic compatibility	IEC61000-4-4(electrical fast transient pulse group) , ± 4KV/5KHz; IEC61000-4-5(surge) , 4KV				
Isolation withstand voltage	The power supply, relay contacts and signal terminals are ≥2300VDC each other, and the isolated weak current signal terminals are ≥600VDC each other				
Operating Ambient	Temperature:-10~+60°C, Humidity: 25~85%				
Storage temperature	Temperature:-25~+70°C, Humidity: 25~85%				

3. Ordering Code Definition

AiFUZZY-806 — ① ② ③ — ④

Code	Dimensions (width × height)
G	48×48mm
D	72×72mm
A	96×96mm
E	48×96mm (vertical)
F	96×48mm (horizontal)

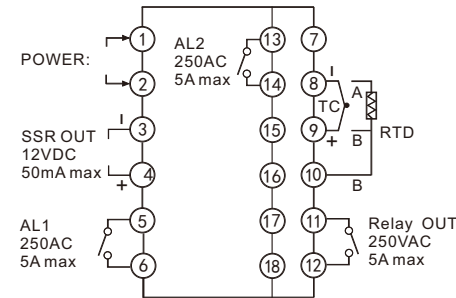
Code	OUT (control output)
Q5	Relay+SSR (Dual type output)

Code	Power supply
Blank	AC100~240V
D	DC12~24V

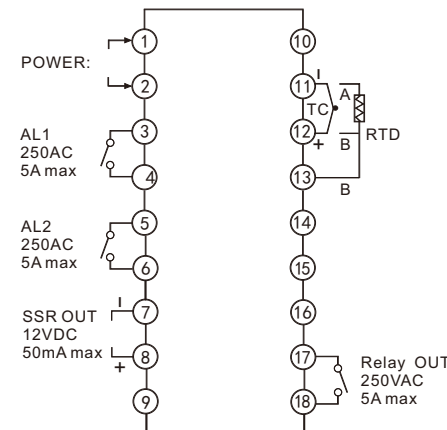
Code	ALM (Alarm)
R1	AL1 (One alarm relay output)
R2	AL1+AL2 (Two alarm relay output)

4. Wiring diagram

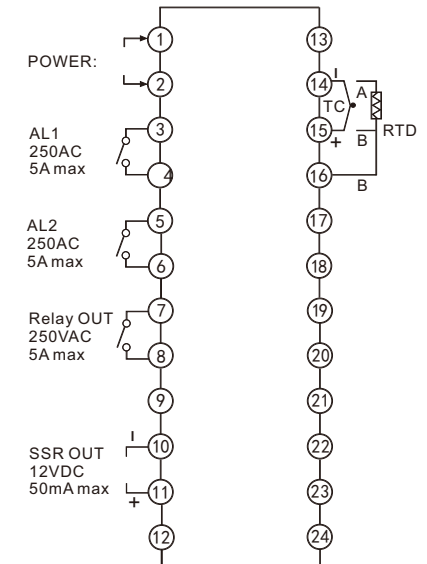
• AiFUZZY-806-G



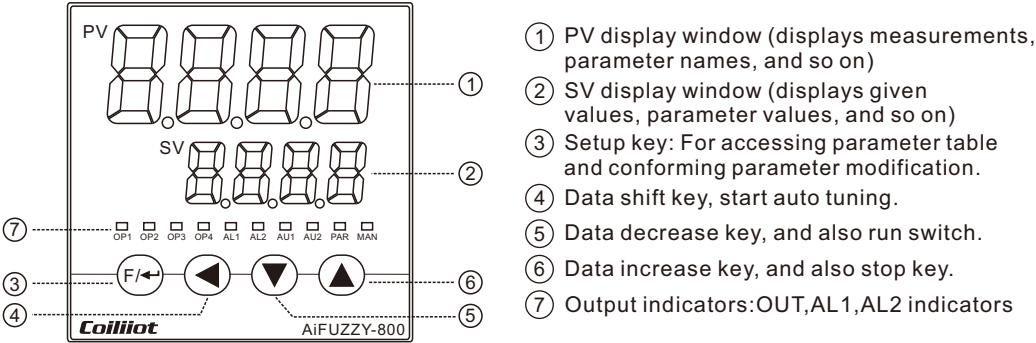
• AiFUZZY-806-D



• AiFUZZY-806-A,E,F

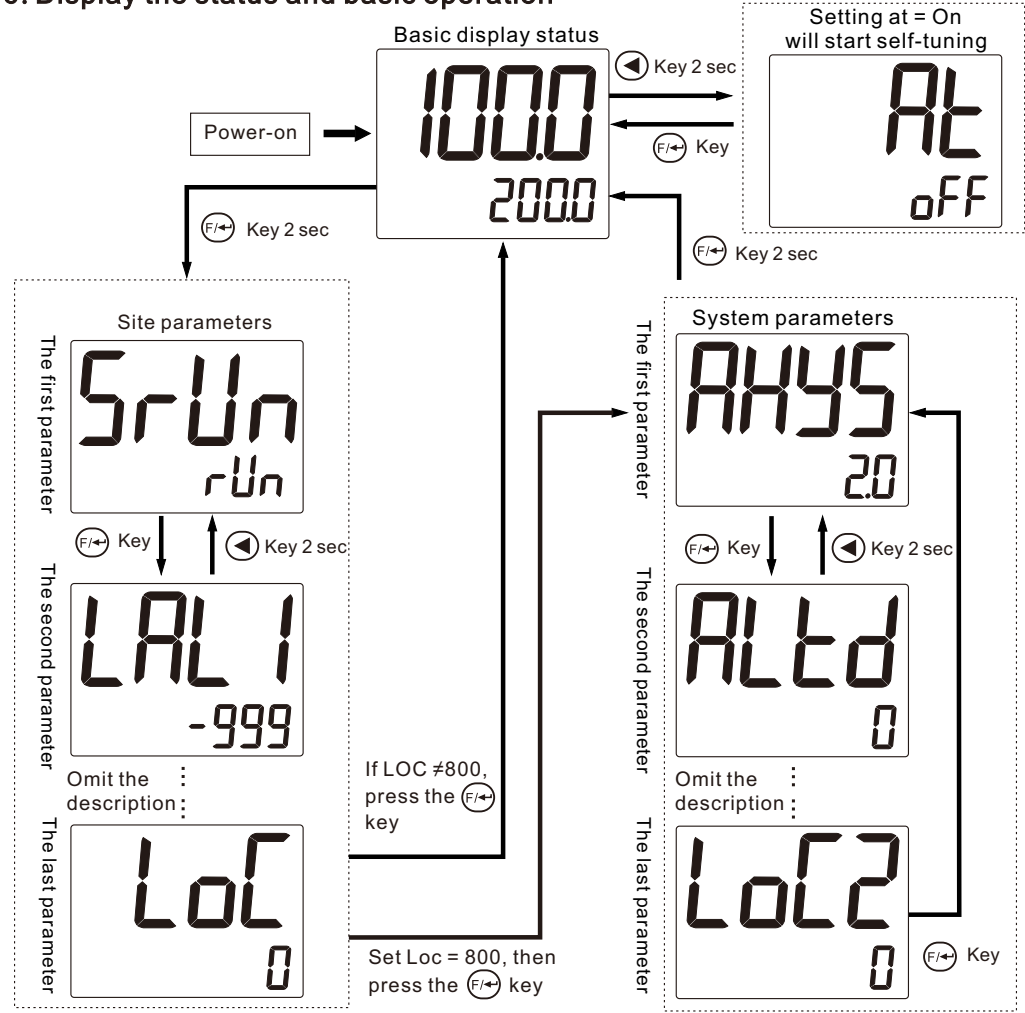


5. Front Panel Description



- ① PV display window (displays measurements, parameter names, and so on)
- ② SV display window (displays given values, parameter values, and so on)
- ③ Setup key: For accessing parameter table and conforming parameter modification.
- ④ Data shift key, start auto tuning.
- ⑤ Data decrease key, and also run switch.
- ⑥ Data increase key, and also stop key.
- ⑦ Output indicators:OUT,AL1,AL2 indicators

6. Display the status and basic operation



●System parameter setting

In the basic display state, press and hold the key for 2 seconds to enter the field parameters setting mode. Set LOC to 800, then press the button to confirm and proceed to the system parameter settings. Use the , , and keys to directly modify the parameter values. Press the key to decrease the data and the key to increase it. When modifying, the value of the decimal point will flash like a cursor. Press and hold a key to quickly adjust the value, which will automatically speed up over time. Press the key to move the cursor to a different data location, making the operation more efficient. Press the key to save the modified parameter values and display the next parameter. Press and hold the key for 2 seconds to return to the previous parameter. To exit the parameter setting mode immediately, press and hold the key for 2 seconds.

●Set Value Setting

In the basic display state, you can directly modify the given value by pressing the , , buttons.

●“At”PID Parameter auto-tuning

To enable optimal PID control parameters using the auto-tuning feature, follow these steps for precise control:
Press and hold the button for 2 seconds until the "At" parameter appears. Set the "At" parameter from "OFF" to "ON," then press the button to confirm. The instrument will begin the auto-tuning process. During this, the word "At" will flash on the basic display state. After two oscillation cycles of ON-OFF control, the instrument will automatically calculate the PID parameters. If you wish to cancel the auto-tuning before completion. Change the "At" parameter from "ON" to "OFF," then press the button to confirm.
The tuning parameter values obtained may vary. To perform the auto-tuning function, first set the given value to the most commonly used or a median value. If the system involves a well-insulated furnace, set the given value to the maximum typically used by the system before starting the auto-tuning. The initial results from auto-tuning may not be optimal. It often requires a period (usually the same duration as the auto-tuning control) to achieve the best results. Do not operate the controller or interrupt the power supply during the auto-tuning process.

7.Parameter list and function

7.1 Field parameters

Press 2 seconds to enter the site parameter settings

Code	Name	Description	Range
SrUn	Running state	run the control state. Stop: Stop State, SV window shows flashing display“StoP”	(Ex-factory value run)
HAL1	AL1 high limit alarm value	“HAL1” is the absolute value alarm or deviation value alarm, by “ALtd” parameter definition. When the value set to Max. will disable this function.(3200)	-999~3200
LAL1	AL1 low limit alarm value	“LAL1” is the absolute value alarm or deviation value alarm, by “ALtd” parameter definition. When the value set to Min. will disable this function.(-999)	(ex-factory value, upper limit: 3200 lower limit: -999)
HAL2	AL2 high limit alarm value	“HAL2” is the absolute value alarm or deviation value alarm, by “ALtd” parameter definition. When the value set to Max. will disable this function.(3200)	
LAL2	AL2 low limit alarm value	“LAL2” is the absolute value alarm or deviation value alarm, by “ALtd” parameter definition. When the value set to Min. will disable this function.(-999)	
Loc	Password lock	Set LOC = 800, then press key to input system parameters.	

7.2 System parameter

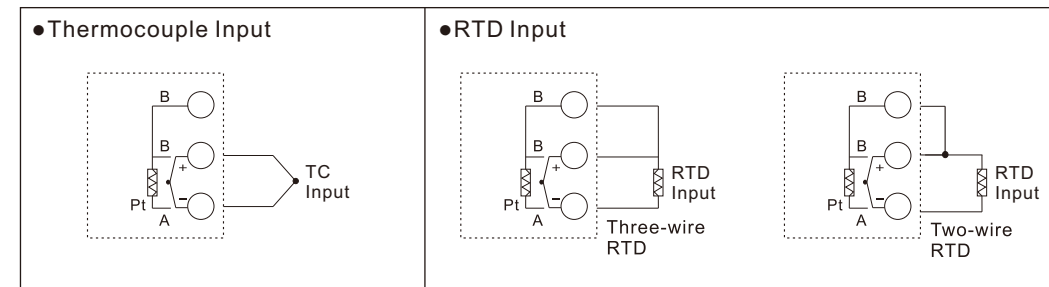
Set Loc = 800, then press the $\odot$ key to enter the following system parameters

<i>RHYS</i>	Alarm hysteresis	Avoid frequent alarm on-off action because of the fluctuation of PV	0~2000 (Default value 2.0)
<i>RLtd</i> (ALtd)	Alarm mode	ALtd=0, AL1 is the deviation value alarm, AL2 is the absolute value alarm. ALtd=1, AL1 and AL2 is the absolute value alarm. ALtd=2, AL1 and AL2 is the deviation value alarm.	0~2 (Default value 1)
<i>CntL</i> (CntL)	Control mode	onoF: on-off control. For situation not requiring high precision. FPId: advanced artificial intelligence "FUZZY+PID" control.	(Default value FPId)
<i>orEv</i> (orEV)	Selection of heating refrigeration	onr: Reverse Acting - An increase in the measured variable results in a decrease in the output. This is typical in heating control systems. ond: Direct Acting - An increase in the measured variable leads to an increase in the output. This is common in refrigeration control systems.	(Default value onr)
<i>P</i>	Proportional band	Proportional band in FPId control is expressed in the same units as the PV, rather than as a percentage of the measurement range. Generally, optimal P, I, D, and CP can be obtained through auto-tuning. These parameters can also be manually input if the correct values are already known.	1~3200 (Default value 25.0)
<i>I</i>	Integration time	The integration time for FPID adjustment is measured in seconds. The integral action is canceled when I=0	1~9999 (Default value 200)
<i>d</i>	Differential time	The differential time for FPID adjustment is measured in tenths of a second (0.1 sec), and the differential effect is canceled when d=0.	0~3200 (Default value 50.0)
<i>CP</i>	Control cycle	CP reflects the instrument operator's ability to adjust the speed. The magnitude of CP affects the control accuracy. For control cycles using SSR or SCR outputs, a shorter duration is preferable, typically ranging from 0.5 to 3.0 seconds. For relay switch outputs, the typical range is between 15 to 40 seconds. When the output relay switches, CP is limited to 3 seconds. During self-tuning (At), CP will be automatically set to an appropriate value, considering both control accuracy and mechanical switch life. When the control mode (CntL) is set to onoF, the action of CP acts either as an output disconnect or as a power-on output with an ON Delay time.	0.2~300.0 (Default value relay output 15.0 SSR output 2.0)
<i>HYS</i>	Control hysteresis	HYS is used in ON-OFF control to prevent the frequent toggling of relay. In a reverse acting (heating) system: the output turns off when PV > SV, and turns on when PV < SV - HYS. In a direct acting (cooling) system: the output turns off when PV < SV, and turns on when PV > SV + HYS.	0~200.0 (Default value 2.0)
<i>oULt</i> (OUT)	Control output	rELy: Relay contact signal output. SSR: Drive solid-state relay output. (When OUT is set to SSR output, the output of the OUT relay can be used as the AL2 alarm output, so that there are two alarm outputs.)	(Default value rELy)
<i>InL</i> (Int)	Input Signal	Selection of input Types for thermocouples or RTD P, E, J, N, Pt100	(Default value K)
<i>dP</i>	Decimal point	0: no decimal. 0.0: one decimal place.	(Default value 0)
<i>Sc</i>	Input Shift Adjustment	SC is used to adjust the input to compensate for errors caused by the transducer, input signal, or automatic cold junction compensation of thermocouples. PV after compensation = PV before compensation + SC. It is generally set to 0. Incorrect settings can lead to measurement inaccuracies.	-199.9~+400.0 (Default value 0)
<i>InF</i>	PV input filter	The value of InF will determine the ability of filtering noise. When a large value is set, the measurement input is stabilized but the response speed is slow. Generally, it can be set to 1 to 3. If great interference exists, then you can increase parameter "InF" gradually to make momentary fluctuation of measured value less than 2 to 5. When the instrument is being metrological verified, "InF" s can be set to 0 or 1 to shorten the response time.	0~40 (Default value 2)

<i>dU</i>	Temperature unit selection	°C: Degrees celsius °F: Degrees fahrenheit	(Default value °C)
<i>SPL</i>	Low limit of SV	Minimum value that SV is allowed to be.	-999~3200 Default value -999
<i>SPH</i>	High limit of SV	Maximum value that SV is allowed to be.	-999~3200 Default value 999
<i>Loc2</i>	Password lock2	LOC2=0: Unlocking, no locking function. LOC2=1: AT self-tuning parameter cannot be set. LOC2=2: Field parameters cannot be set. LOC2=3: SV setting value cannot be set LOC2=4: AT self-tuning, The current field parameter and SV setting values can not be set	0~4 (Default value 0)

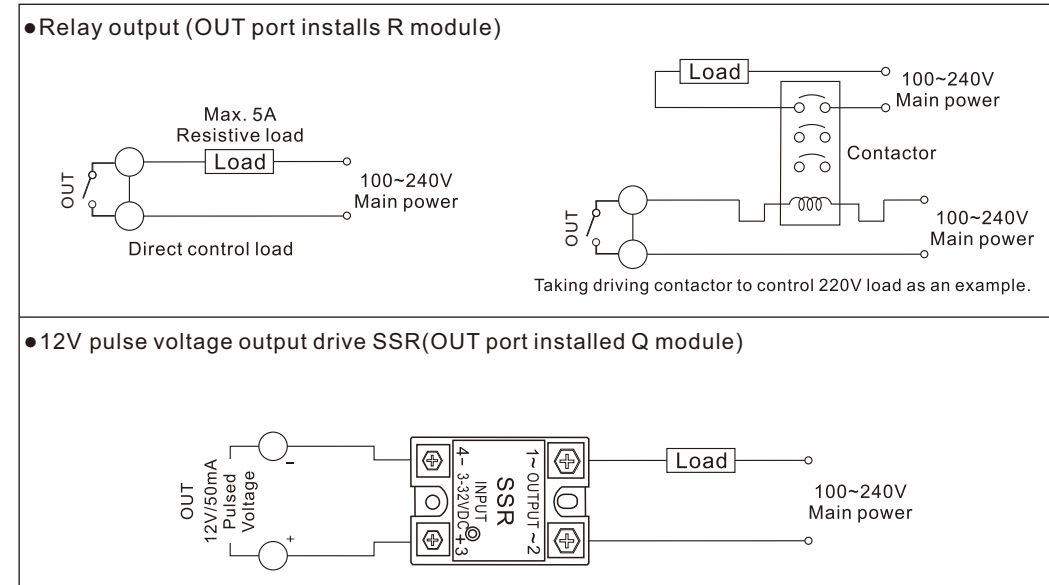
8. Partial application wiring method

8.1 The wiring method of the input signal



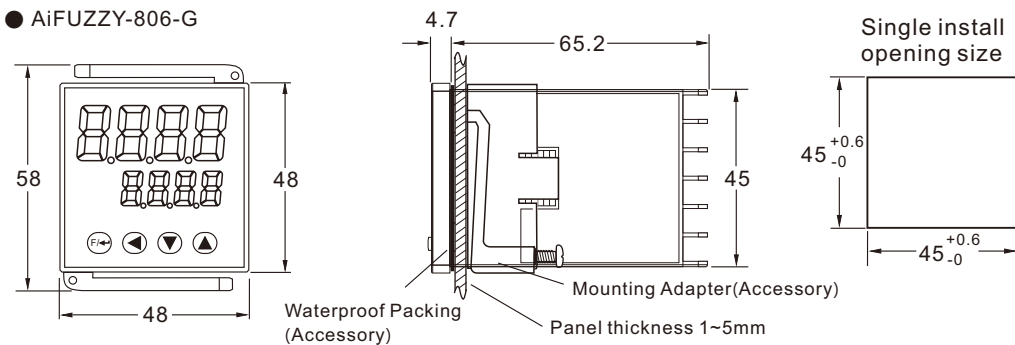
* If the input wiring error, sensor damage, over-range or Int settings and input sensor types are inconsistent, there will be "orAL" warning flicker. After these faults need to be eliminated, the PV can measure the display normally.

8.2 Main control output wiring method

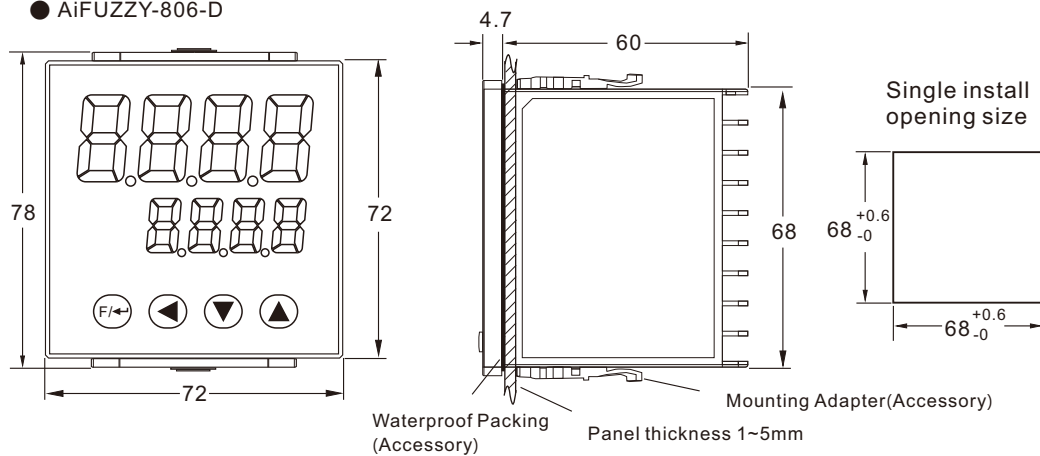


9. Dimensions (in mm) and installation instructions

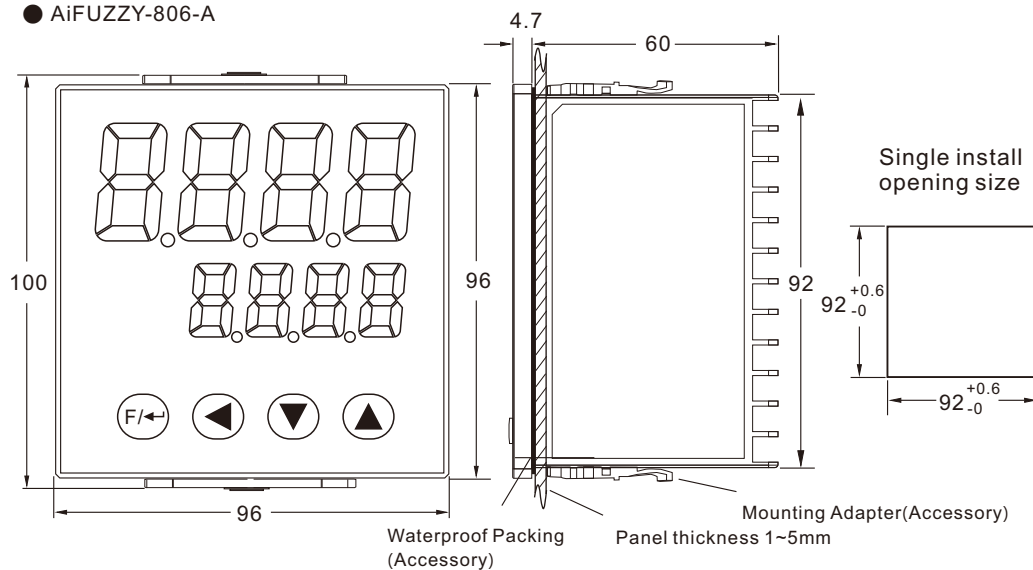
● AiFUZZY-806-G



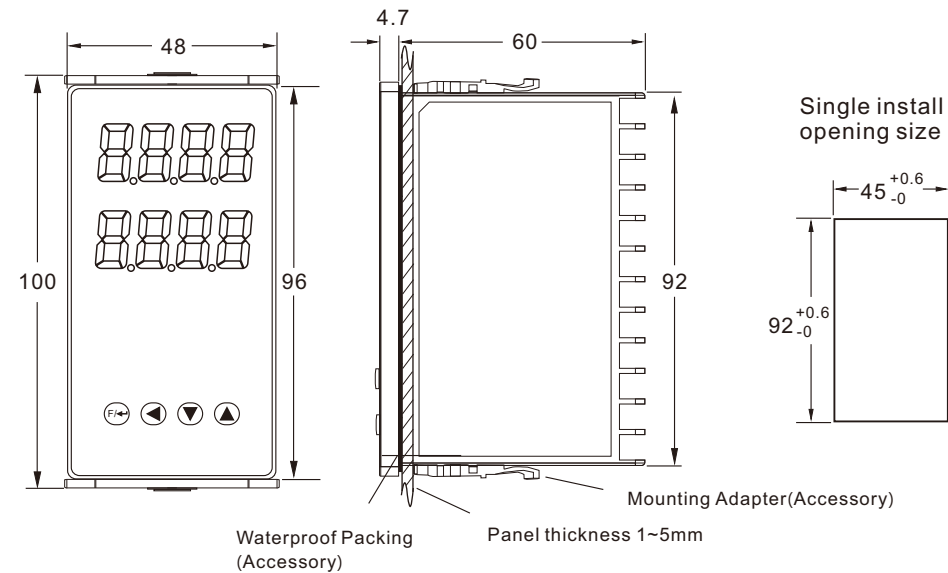
● AiFUZZY-806-D



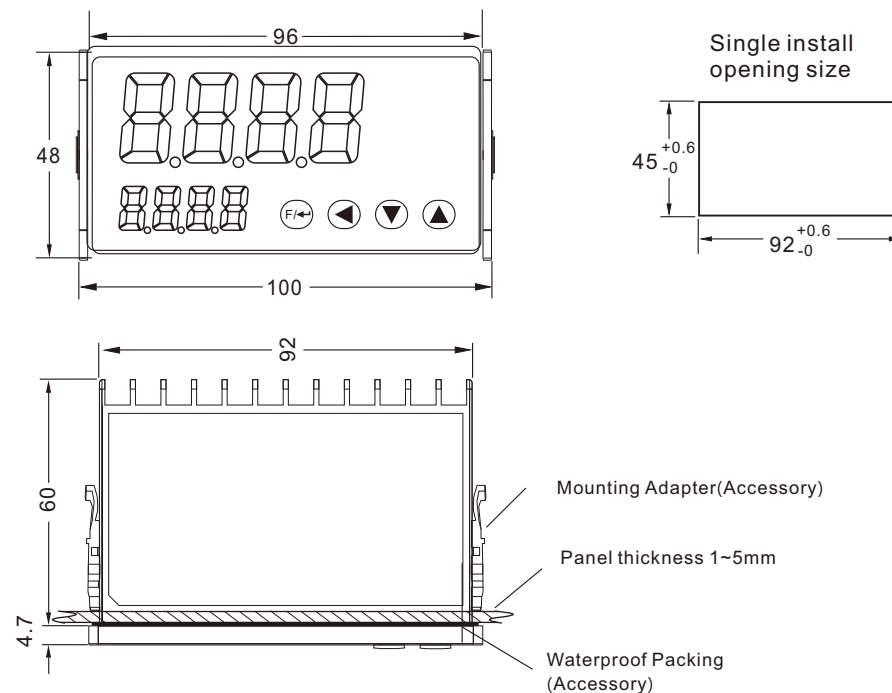
● AiFUZZY-806-A



● AiFUZZY-806-E



● AiFUZZY-806-F



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