

AI SERIES UNIVERSIAL TEMPERATURE CONTROLLER/ PID CONTROLLER

PRODUCT INTRODUCTION

AI series high performance PID temperature controller/ PID controller is designed for users with high requirements for control accuracy, supports three-phase three-wire phase-shift triggering output(AI-733/719), position proportional output for valve motor forward/ reverse control, builds a cascade or proportional control system functions(AI-719 /759) etc, in addition to supporting full functionality of universal PID controller.

FUNCTIONS AND FEATURES

- Programmable universal input, non-linear input customized multi-point correction function.
- Advanced modular construction with multiple output types satisfying requirements of various applications.
- With standard PID, AI artificial intelligence adjustment APID, MPT and other adjustment methods, and excellent control characteristics including self-tuning, self-learning function, no overshoot and no undershoot.
- Equipped with power-off alarm function to avoid false alarms when powered on.
- Support RS485 or RS232 communication interface, can be used as the lower machine for AIDCS, split paperless recorder and touch screen control system.
- Allow self-programming operation and self-configured password.
- Adopts advanced modular structure, provides various kinds of output specifications and meeting a wide range of applications.
- AI-716P/ 719P/ 733P/ 756P/ 759P has program control function and adopts AI artificial intelligence adjustment algorithm with a curve fitting function to obtain a smooth curve control effect.
- Anti-interference performance meets the requirements of electromagnetic compatibility under harsh industrial conditions.

RECOMMEND APPLICATION

- Crystal Growth
- Superconducting Material
- Precision Laboratory Equipment
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- 0.2%FS measuring accuracy
- 30 segments program
- AIBUS/ MODBUS dual protocols
- 3-year free warranty



- Dual 5-digit display
- 0.1%FS measuring accuracy
- 30 segments program
- AIBUS/ MODBUS dual protocols
- 3-year free warranty



- 0.1%FS measuring accuracy
- Heating/ cooling dual PID output
- Position proportional output for valve control
- Hand-auto switching function
- 50 segments program
- AIBUS/ MODBUS dual protocols
- 3-year free warranty



- Dual 5-digit display
(Same as AI-719/719P)



- 0.2%FS measuring accuracy
- three-phase phase-shift trigger output
- Hand-auto switching function
- 30 segments program
- AIBUS/ MODBUS dual protocols
- 3-year free warranty

MODEL SELECTION AND SPECIFICATIONS

AI-		□ □ □ □ □ □ □ □		Specifications	
Model	716				0.2%FS measuring accuracy, support AIBUS/ MOSBUS protocols
	716P				based on AI-716, 30 segments programmable function is added
	719				0.1%FS measuring accuracy, hand-auto switching, soft-start, support AIBUS/ MOSBUS protocols
	719P				based on AI-719, 50 segments programmable function is added
	733				0.2%FS measuring accuracy, hand-auto switching, support AIBUS/ MOSBUS protocols, three-phase phase-shift trigger output
	733P				based on AI-733, 30 segments programmable function is added
	756				0.1%FS measuring accuracy, dual 5-digit display, same as AI-716
	756P				based on AI-756, 30 segments programmable function is added
	759				0.1%FS measuring accuracy, dual 5-digit display, same as AI-719
	759P				based on AI-759, 50 segments programmable function is added
Panel size	A				96*96*100mm
	A2				96*96*100mm, with 25 segments and 4 levels of luminosity
	B				160*80*100mm
	B2				160*80*100mm, with 25 segments and 4 levels of luminosity
	C				80*160*100mm
	C3				80*160*100mm, with 50 segments and 2 levels of luminosity
	D				72*72*95mm
	D2				48*48*95mm (10 terminals)
	D6				48*48*95mm (12 terminals)
	E				48*96*100mm
	E2				48*96*100mm, with 25 segments and 4 levels of luminosity
	E5				48*96*100mm, DIN rail mounted type
Multiple input (MIO)	I4				2-wire transmitter or 4-20mA signal input, provide 24VDC to transmitter
	I5				ON-OFF input module for dual SV switch or run/stop program
	V*				V24, V12, V10 is for 24VDC, 12VDC, 10VDC power supply module
Output (OUTP)	L1				large volume relay contact output (250VAC/2A) (Chinese brand)
	L2				small volume relay contact output (250VAC/1A) (Omron brand)
	L4				small volume relay contact output (250VAC/2A) (Omron brand)
	L5				dual channel N/O relay contact output (250VAC/2A) (Chinese brand)
	G				SSR voltage output (12VDC/30mA)
	X3/X5				linear current 4-20mA output (X5 has own isolated power)
	K1/K3				thyristor zero crossing trigger output (K1: single-phase, K3: three-phase)
	K5/K6				single-phase thyristor phase-shift trigger output (K5: 220V, K6: 380V)
Alarm (ALM)	K9				three-phase phase-shift trigger output (only for AI-719/733)
	L0				large volume relay contact output (250VAC/2A) (Chinese brand)
	L2				small volume relay contact output (250VAC/1A) (Omron brand)
	L3				dual channel N/O relay contact output (250VAC/2A) (Chinese brand)
	L4				small volume relay contact output (250VAC/2A) (Omron brand)
Auxiliary output (AUX)	G				SSR voltage output (12VDC/30mA)
	L0				large volume relay contact output (250VAC/2A) (Chinese brand)
	L1				large volume relay contact output (250VAC/2A) (Chinese brand)
	L2				small volume relay contact output (250VAC/1A) (Omron brand)
	L3				dual channel N/O relay contact output (250VAC/2A) (Chinese brand)
	L4				small volume relay contact output (250VAC/2A) (Omron brand)
	X3/X5				linear current 4-20mA output (X5 has own isolated power)
Communication (COMM)	S/S4				RS485 communication interface (S4 has own isolate power supply)
	X3/X5				linear current 4-20mA output (X5 has own isolated power)
Shell material				-UL	with UL standard certificate, flame retardant shell

ATTENTION:

- 1.AI-756/ 756P/ 759/ 759P supports only panel size A and E.
 - 2.L5 installed in OOTP for AI-719/ 719P/ 759/ 759P is for position proportional output. X3/X5 installed in COMM is for retransmission output.
 - 3.Output for AI-733/733P is fixed as three-phase phase-shift trigger output and occupies auxiliary input, so panel size doesn't accept D, D2, D6 or E5 when output(OOTP) is K9.
 - 4.D size doesn't have MIO, and its COMM and ALM share one slot. If controller installs RS485 module, it doesn't have ALM; If controller requires alarm function it can install alarm module in AUX.
 - 5.D2 size doesn't have MIO and ALM, and its COMM and AUX share one slot. So controller should choose either RS485 or alarm function. If require both RS485 and alarm, users should choose D6 size which supports module SL. D2 size doesn't support 0~5V/ 1~5V linear current input. Users can transform the signal into 0~500mV/ 100~500mA or choose D6 size.
 - 6.About MIO: it supports 4~20mA/ 0~20mA input or signals from 2-wire transmitter when installing I4 module. Yudian instruments support thermocouple and RTD input as standard configuration.
- About V* module: Yudian instruments supply 24VDC, 12VDC, 10VDC and others for feed supply for external equipment, and it can be installed in any slots. It is recommended to installed in the slot of MIO, AUX and COMM by order.

MODEL SELECTION

There are maximum five module slots: multi-function input (MIO), main output (OOPT), alarm (ALAM), auxiliary output (AUX) and communication (COMM). The modules can be purchased together or individual, and can be assembled freely.

Example:

AI-719AI4X3L3L3S4-24VDC

AI-719 A I4 X3 L3 L3 S4 -24VDC

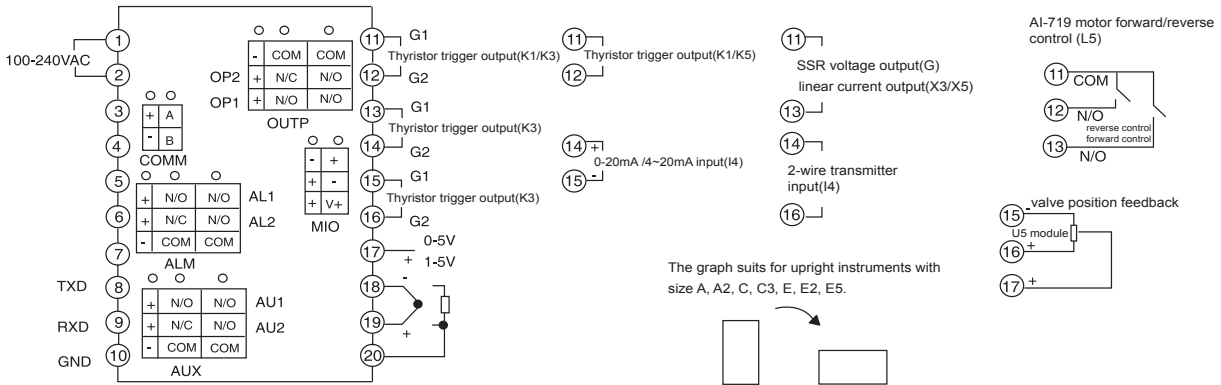
① ② ③ ④ ⑤ ⑥ ⑦

- ① Main model for instrument is AI-719, high performance temperature controller/ PID controller, 0.1%FS measuring accuracy, multiple input, PID output, retransmission output, alarm and RS485 communication.
- ② Front panel size is B 96*96mm.
- ③ I4 module in MIO means analog signal 4~20mA/0~20mA input or signals from 2-wire transmitter input, providing 24VDC feed supply.
- ④ Main output is analog output: 0~10mA/ 0~20mA/ 4~20mA.
- ⑤ Both ALM and AUX are installed with L3 module which means 4 channels alarm relay output.
- ⑥ Communication module S4 is in COMM which means instrument supports RS485 communication. It is recommended to choose S4 module when there's X3 in OOTP.
- ⑦ Power supply is 24VDC. If let blank, power supply is 100~240VAC, 50/60Hz.

*Please note AI-719 supports heating/ cooling dual PID output, so users can install output module in AUX and then set OPL≤0, the controller will support dual PID output.

WIRING DIAGRAM

A.A2.B.B2.C.C3.E.E2.E5.F

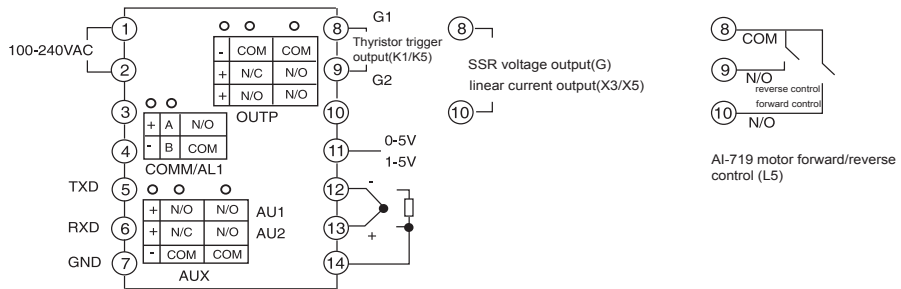


The graph suits for upright instruments with size A, A2, C, C3, E, E2, E5.

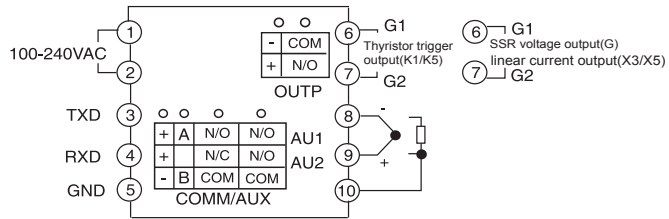


For instruments with size B, B2, F, please clockwise rotate the graph 90 degree and the numbers of terminals keep same.

D (72mm × 72mm)



D2 (48mm × 48mm)



D6 (48mm × 48mm)

