

APTUS AUTOMATION

Temperature Controller

User Manual

Notice before start-up

Please confirm the specification of instrument is to totally with your requirement before using it, also read this manual in detail.



Danger

Danger! Electric Shock! DON'T touch AC power wiring terminals when instrument has been powered! Keep the power off until all of the wirings are completed!



Warning

- 1) Please confirm the AC power wiring to instrument is correct, otherwise it would be caused aggravated damage on instrument.
- 2) Be sure to use the rated power supply, otherwise it would be caused aggravated damage on instrument.
- 3) Please confirm wires are connected with correct terminal (Power, Input and Output).
- 4) Avoid installing instrument in following spaces:
 - I. A place where the ambient temperature may reach beyond the range from 0 to 50°C
 - II. A place where the ambient humidity may reach beyond the range from 20 to 90% RH.
 - III. A place where the instrument likely to come into contact with water, oil, chemicals, steam and vapor.
 - IV. A place where the instrument is subject to interface with static electricity, magnetism and noise.
- 5) For proximity input, use shield compensating lead wire.

TECHNICAL SPECIFICATIONS

Product Name : Temperature Controller

Model No. : A3005-X-L-X3

Output : Relay (5 Amp. 1 CO), 1 SSR output (12Vdc)
O/P 1 :- 1 Relay or 1 SSR . For Control O/P (PID,ON/OFF)

Input : RTD-PT 100(2W,3W), Thermocouples K Type, J Type

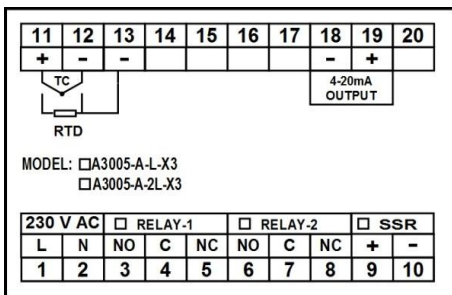
Range : RTD-PT 100 (0.1 °C) - -99.9 to 400.0°C
RTD-PT 100 (1°C) - -99 to 400°C
Thermocouple K Type - 0000 to 1200°C
Thermocouple J Type - 0000 to 650°C

Resolution : RTD-PT 100 - 1°C or 0.1°C
K Type - 1°C
J Type - 1°C

Accuracy : Better than $\pm 0.5\%$ of Full Scale

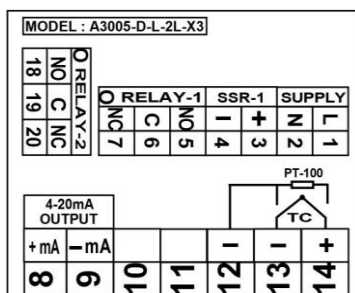
Power Supply : 230VAC $\pm 10\%$, 50Hz.

A3005-A (96x96) Terminal Wiring



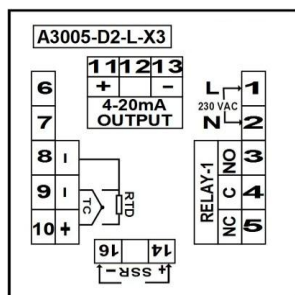
INPUT TYPE	A3005-A-L / A3005-A-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor Input	Terminal 11(TC+) & 12(TC-)
RTD Sensor Input	Terminal 11(A), 12(B) & 13(B')
4 to 20mA Output	Terminal 19(+), & 18(-)
Output 1(Relay-1)	Terminal 3(NO), 4(C) & 5(NC)
Output 2(Relay-1)	Terminal 6(NO), 7(C) & 8(NC)
SSR Output	Terminal 9(+), & 10(-)

A3005-D(72x72) Terminal Wiring



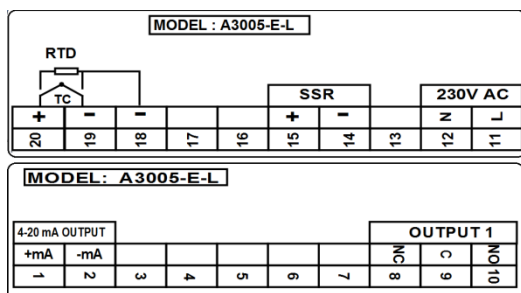
INPUT TYPE	A3005-D-L / A3005-D-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor Input	Terminal 14(TC+) & 13(TC-)
RTD Sensor Input	Terminal 14(A), 13(B) & 12(B')
4 to 20mA Output	Terminal 8(+), & 9(-)
Output 1(Relay-1)	Terminal 5(NO), 6(C) & 7(NC)
Output 2(Relay-1)	Terminal 18(NO), 19(C) & 20(NC)
SSR Output	Terminal 9(+), & 10(-)

A3005-D2(48x48) Terminal Wiring



INPUT TYPE	A3005-D2-L / A3005-D2-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor Input	Terminal 10(TC+) & 9(TC-)
RTD Sensor Input	Terminal 10(A), 9(B) & 8(B')
4 to 20mA Output	Terminal 11(+), & 13(-)
Output 1(Relay-1)	Terminal 3(NO), 4(C) & 5(NC)
SSR Output	Terminal 14(+), & 16(-)

A3005-E (48x96) Terminal Wiring



INPUT TYPE	A3005-E-L / A3005-E-2L
230 V AC Power supply	Terminal 11 & 12
Thermocouple Sensor Input	Terminal 20(TC+) & 19(TC-)
RTD Sensor Input	Terminal 20(A), 19(B) & 18(B')
4 to 20mA Output	Terminal 1(+), & 2(-)
Output 1(Relay-1)	Terminal 10(NO), 9(C) & 8(NC)
SSR Output	Terminal 15(+), & 14(-)

DISPLAY MESSAGES

The explanation of the various Display Messages that would be visible on the instrument.

DISPLAY	DESCRIPTION
IPLO	Input signal below lower range setting
IPHI	Input Signal higher than higher range setting
OPEn	No Signal or I/P Wire Break or Sensor Burn Out
tUnE	Instrument is in Auto Tune PID Control

PARAMETER MENU

- To set parameters which are required to change frequently, go in parameter setting menu.
- Press SET Key till 1 sec to enter in this menu.
- Press the SET Key for 5 Seconds to go into configuration menu.
- Using UP & DOWN key to set the required value.
- Otherwise press the Enter key to exit & save changes.

KEY	LOWER DISPLAY	UPPER DISPLAY	FUNCTION	RANGE
SET	SEt.1	100	Set1: Set value of Temperature for Relay-1 operation.	rngL~rngH
SET	SEt.2/SOAK	50	(If the parameter Con.2 is set to SOAK mode): SOAK: Set value of Time for SOAK operation. (If the parameter Con.2 is not set to SOAK mode): Set 2: Set value of Temperature for Relay-2 operation. (This parameter is available if the Con.2 mode is not selected to OFF)	00.00~99.59/ 000.0~999.9/ 0000~9999 or rngL~rngH
SET (> 5 sec)	PASS	0	Password: Enter the Password 0808 to go into configuration menu. Using UP & DOWN key to set the required value.	-

Configuration menu:

KEY	LOWER DISPLAY	UPPER DISPLAY	FUNCTION	RANGE
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SET	InPt	J	Input Type: Set the Input sensor type. └----- Thermocouple type K sensor J----- Thermocouple type J sensor Γtd 1----- 1° RTD Pt-100 [three-wire] sensor Γtd.1----- 0.1° RTD Pt-100 [three-wire] sensor	K/ J / rtd1 / rtd.1
SET	OFSt	0	Offset Value: Set the Offset value.	-999~999
SET	rngL	0	Range Low: Set the value of range low parameter for display.	-
SET	rngH	1200	Range High: Set the value of range high parameter for display.	-
SET	Con.1	PId	Control Output-1: Set the mode of Relay-1 operation. PId: Relay-1 will work in PID mode. HEAt: Relay-1 will work in HEATING mode → [PV<=(Set1-HYS), Relay-1 On], [PV>=(Set1), Relay-1 Off] COOL: Relay-1 will work in COOLING mode. → [PV<=(Set1), Relay-1 Off], [PV>=(Set1+HYS), Relay-1 On After delay time]	PId/HEAt/ COOL
SET	p-b	17.7	Proportional Gain: Set the Proportional Gain in temperature for PID Action. (This parameter is available if the Con.1 mode is selected to PID)	0.1~999.9
SET	In-t	315	Integral Time: Set the value of this parameter. (This parameter is available if the Con.1 mode is selected to PID)	1~9999
SET	dr-t	7	Derivative Gain: Set the value of this parameter. (This parameter is available if the Con.1 mode is selected to PID)	1~9999
SET	CY-t	3	Cycle Time: Set the value of this parameter. (This parameter is available if the Con.1 mode is selected to PID)	1~9999
SET	HYS.1	10	Hysteresis-1: Set the Hysteresis in temperature for Relay-1 operation. (This parameter is available if the Con.1 mode is selected to HEAt or COOL)	-99~99
SET	dLY	05	Delay Time: Set the Delay time in Relay actions in COOL mode. (This parameter is available if either Con.1 mode is selected to COOL)	01~999 sec
SET	SEtr	YES	Set in running: Set the Temperature value for Relay-1 operation, in running mode. YES: By pressing UP / DOWN key, Temperature value can be changed.	YES/nO
SET	C-OP	tEmP	CONTROL OUTPUT: Set C-OP for 4-20mA Output. tEmP: Retransmission Output. Cntr: Control PID Output. (Cntr parameter is available only if Con.1 mode is selected to PID)	tEmP/Cntr
SET	CLAP	100.0	CLAMP: Set a clamp value for output in 0 to 100.0% (This parameter is available if C-OP mode is selected in Cntr)	0~100.0
SET	C-dr	FOr	Control direction : Press upkey to Set the 4-2mA O/P direction. FOR: Output from 4 to 20mA. REV: Output from 20 to 4mA. (This parameter is available if the Con.1 mode is selected to PID)	FOr/rEV
SET	Con.2	OFF	Control Output-2: Press upkey to Set the mode for Relay-2 operation. HEAt: Relay-2 will work in HEAT mode. → [PV<=(Set2-HYS2), Relay-2 On], [PV>=(Set2), Relay-2 Off] COOL: Relay-2 will work in COOL mode. → [PV<=(Set2), Relay-2 Off], [PV>=(Set2+HYS2), Relay-2 On After delay time] LOAL: Relay-2 will work in LOAL mode. → [PV<=(Set2), Relay-2 On], [PV>=(Set2+HYS2), Relay-2 Off] HIAL: Relay-2 will work in HIAL mode. → [PV<=(Set2-HYS2), Relay-2 Off], [PV>=(Set2), Relay-2 On] LdAL: Relay-2 will work in LdAL mode. → [PV<=(Set-Set2), Relay-2 On], [PV>=((Set-Set2)+HYS2), Relay-2 Off] HdAL: Relay-2 will work in HdAL mode. → [PV<=((Set+Set2)-HYS2), Relay-2 Off], [PV>=(Set+Set2), Relay-2 On] SOAK: Relay-2 will work for SOAK completion alarm. → When PV>=(Set1), soak time will start, after that relay-2 will be On And after alarm time all operation is Off. OFF: Relay-2 will be OFF.	HEAt/COOL/ LOAL/HIAL/ LdAL/HdAL/ OFF
SET	UnIt	SEC	Unit: select the unit for SOAK time parameter. (This parameter is available if the Con.2 mode is selected to SOAK)	SEC/ mIn/ HOUr
SET	tIme	9999	Range for SOAK time: Press upkey to Set the range for SOAK time parameter. (This parameter is available if the Con.2 mode is selected to SOAK)	9999/999.9/ 99.59
SET	Alrm	5	Alarm time: Set the Alarm time for Relay-2 operation. (This parameter is available if the Con.2 mode is selected to SOAK)	0~99
SET	mEm	YES	Soak time Memory: Press upkey to Set the mode for soak timer memory. YES: Running soak time will be saved in memory while power fail occurs. nO: Running soak time will not be saved in memory while power fail occurs. (This parameter is available if the Con.2 mode is selected to SOAK)	YES/nO

SET	HYS.2	5	Hysteresis-2: Set the Hysteresis in temperature for Relay-2 operation. (This parameter is available if the Con.2 mode is not selected to OFF)	-99~99
SET	dLY	05	Delay Time: Set the Delay time in Relay actions in COOL mode. (This parameter is available if Con.2 mode is selected in COOL and Con.1 mode is not selected in COOL)	01~999 sec

Display Indication:

- Actual Temperature (PV) ----- = on Upper display
- Set Temperature (SV)----- = on Lower display
- Running Soak time value----- = on Lower display, while running soak timer

[SOAK TIMER WORKING:]

- ❖ If Soak mode is selected...
 - ✓ When PV >= SET.1, soak timer will start to run according to selected unit and range for the time.
 - ✓ After the soak timer completed, the RELAY-1 will be OFF and RELAY-2 will be ON for the ALARM time shown in menu.
 - ✓ After the ALARM time completed, The RELAY-2 will be OFF.
 - ✓ Thus the process is completed. And no relay will work now.
 - ✓ The whole process is can be reset by pressing front RESET KEY.
 - ✓ If MEM = YES selected, the soak time will be saved in power fail occurs.
 - ✓ If MEM = NO selected, the soak time will be reset when power fail occurs.