

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 / A3005-X-2L / A305-X-L / A305-X-2L

Output : Up to 2 nos. of Relay (5 Amp. 1 CO) ,1 SSR output (12Vdc)
O/P 1 :- 1 Relay or 1 SSR. For Control O/P PID,ON/OFF.
O/P 2 :- 1 Relay. For Alarm O/P HEAT/COOL/LOAL/HIAL/ LdAL/ HdAL .

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

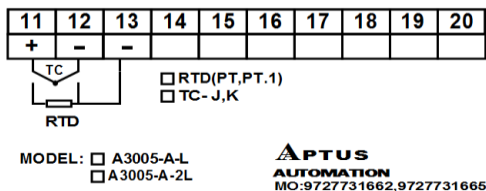
Range : RTD-PT 100 (0.1 °C) - -99.9 to 400.0°C
RTD-PT 100 (1°C) - -99 to 400°C
Thermocouple K Type - 0000 to 1200°C
Thermocouple J Type - 0000 to 650°C

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.

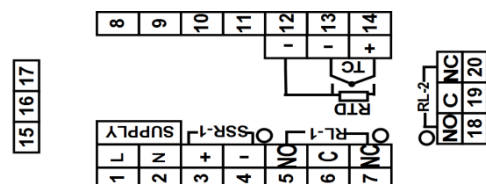
A3005-A (96x96) Terminal Wiring



230 V AC	RELAY-1	RELAY-2	SSR
L N NO C NC	NO C NC	+	-
1 2 3 4 5	6 7 8	9	10

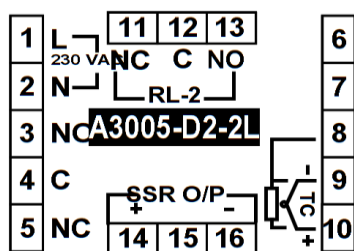
INPUT TYPE	A3005-A-L/A3005-A-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor Input	Terminal 11(TC+) & 12(TC-)
RTD Sensor Input	Terminal 11(A), 12(B) & 13(B')
Output 1(Relay)	Terminal 3(NO), 4(C) & 5(NC)
Output 1(SSR)	Terminal 9(SSR+) & 10(SSR-)
Output 2(Relay)	Terminal 6(NO), 7(C) & 8(NC)

A3005-D (72x72) Terminal Wiring



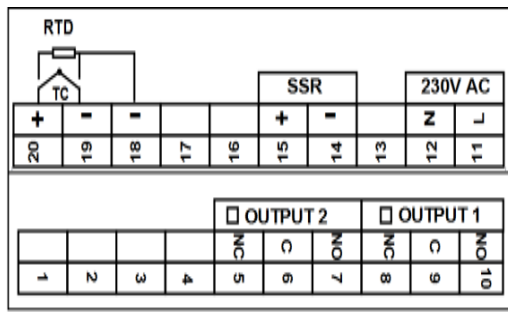
INPUT TYPE	A3005-D-L/A3005-D-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor Input	Terminal 14(TC+) & 13(TC-)
RTD Sensor Input	Terminal 14(A), 13(B) & 12(B')
Output 1(Relay)	Terminal 5(NO), 6(C) & 7(NC)
Output 1(SSR)	Terminal 3(SSR+) & 4(SSR-)
Output 2(Relay)	Terminal 18(NO), 19(C) & 20(NC)

A3005-D2 (48x48) Terminal Wiring



INPUT TYPE	A3005-D2-L/A3005-D2-2L/A305-D2-L/A305-D2-2L
230 V AC Power supply	Terminal 1 & 2
Thermocouple Sensor	Terminal 10(TC+) & 9(TC-)
RTD Sensor Input	Terminal 10(A), 9(B) & 8(B')
Output 1(Relay)	Terminal 3(NO), 4(C) & 5(NC)
Output 1(SSR)	Terminal 14(SSR+) & 16(SSR-)
Output 2(Relay)	Terminal 13(NO), 12(C) & 11(NC)

A3005-E (96x48) 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')
Output 1(Relay)	Terminal 10(NO), 9(C) & 8(NC)
Output 1(SSR)	Terminal 15(SSR+) & 14(SSR-)
Output 2(Relay)	Terminal 7(NO), 6(C) & 5(NC)

CONFIGURATION 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.
- Otherwise press the Enter key to exit & save changes.

KEY	LOWER DISPLAY	UPPER DISPLAY	FUNCTION	RANGE
SET (> 1 sec)	SEt	100	Set: Set value of Temperature for Relay-1 operation. Using UP & DOWN key to set the required value.	rngL~rngH
SET	SEt 2	50	Set 2: Set value of Temperature for Relay-2 operation. Using UP & DOWN key to set the required value. (This parameter is available if the Con.2 mode is not selected to OFF)	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
SET	InPt	J	Input Type : Set the Input sensor type. Using UP key to change the Input sensor type. ├----- Thermocouple type K sensor J----- Thermocouple type J sensor Rtd 1----- 1° RTD Pt-100 [three-wire] sensor Rtd.1----- 0.1° RTD Pt-100 [three-wire] sensor	K/ J / rtd1 / rtd.1
SET	OFSt	0	Offset Value: Set the Offset value. Using UP & DOWN key to set the required value.	-999~999
SET	rngL	0	Range Low: Set the value of range low parameter for display. Using UP & DOWN key to set the required value.	-
SET	rngH	1200	Range High: Set the value of range high parameter for display. Using UP & DOWN key to set the required value.	-
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] Using UP key to set the Relay-1 operation mode.	PId/HEAt/ COOL
SET	p-b	17.7	Proportional Gain: Set the Proportional Gain in temperature for PID Action. Using UP & DOWN key to set the required value. (This parameter is available if the Con.1 mode is selected to PID)	0.1~999.9

KEY	LOWER DISPLAY	UPPER DISPLAY	FUNCTION	RANGE
SET	In-t	315	Integral Time: Set the value of this parameter. Using UP & DOWN key to set the required value. (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. Using UP & DOWN key to set the required value. (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. Using UP & DOWN key to set the required value. (This parameter is available if the Con.1 mode is selected to PID)	1~9999
SET	HYS	10	Hysteresis-1: Set the Hysteresis in temperature for Relay-1 operation. Using UP & DOWN key to set the required value. (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. Using UP & DOWN key to set the required value. (This parameter is available if either Con.1 or Con.2 mode is selected to COOL)	01~999 sec
SET	Con.2	OFF	Control Output-2: Set the mode of 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] 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] OFF: Relay-2 will be OFF. → [Relay-2 Off] Using UP key to set the Relay-2 operation mode.	HEAt/COOL/ LOAL/HIAL/ LdAL/HdAL/ OFF
SET	HYS2	5	Hysteresis-2: Set the Hysteresis in temperature for Relay-2 operation. Using UP & DOWN key to set the required value. (This parameter is available if the Con.2 mode is not selected to OFF)	-99~99
Enter	SEtr	YES	Set in running: Set the Temperature value for Relay-1 operation, in running mode. Using UP key to set the required value. YES: By pressing UP / DOWN key, Temperature value can be changed. nO: By pressing UP / DOWN key, Temperature value can't be changed.	YES/nO

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

Display Indication:

- Actual Temperature (PV) ----- = on Upper display
- Set Temperature (SV)----- = on Lower display