

Plug-in Signal Conditioners M-UNIT

THERMOCOUPLE ALARM
(dual or quad alarm trip; field-configurable)

MODEL **AS4T**

MODEL & SUFFIX CODE SELECTION

MODEL _____ AS4T-□-□□

OUTPUT _____

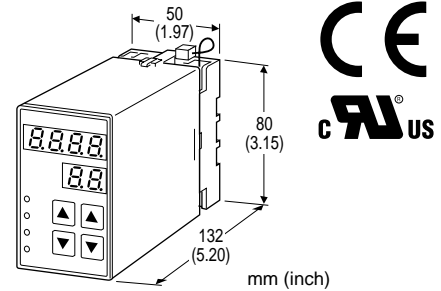
2 : 4 points; N.O. or make contact
 3 : 4 points; N.C. or break contact
 5 : 2 points; SPDT or transfer contact

POWER INPUT _____

AC Power	DC Power
M2 : 100 – 240V AC	R : 24V DC
	P : 110V DC

OPTIONS _____

/UL : UL approval



Functions & Features

- Providing relay outputs at preset temperature levels
- Quad or dual trip
- Setting and display in engineering unit values
- Setpoint adjustments with the front keypad
- Software lock
- Adjustable hysteresis (deadband)
- On-delay timer
- Hi/Lo trip and energized/de-energized coil independently selectable for each setpoint
- Enclosed relays
- Relays can be powered by 200V AC and 100V DC
- High-density mounting on DIN rail

Typical Applications

- Annunciator
- Various alarm applications

ORDERING INFORMATION

Specify code number. (e.g. AS4T-2-R)

GENERAL SPECIFICATIONS

Construction: plug-in

Connection: M3.5 screw terminals

Housing material: flame-resistant resin (black)

Isolation (basic insulation): input to output to power

Setpoint adjustments: front key pad

Sampling cycle: 100 millisecc.

■DISPLAY

LED: 8 mm (.31") 7 segment, red

Number of display digits: 4 digits for DATA display;
2 digits for ITEM display

PV indication: temperature in engineering unit

Overrange indication: LEDs flashing

Power saving mode: displays turn off if the keys are untouched for a preset time period

LEDs: red lights turn on in tripped conditions

Burnout protection: upscale standard; downscale or no burnout optional by programming

INPUT & OUTPUT

■ **INPUT:** thermocouples

Input resistance: 1M Ω minimum

Burnout sensing: 45nA \pm 10%

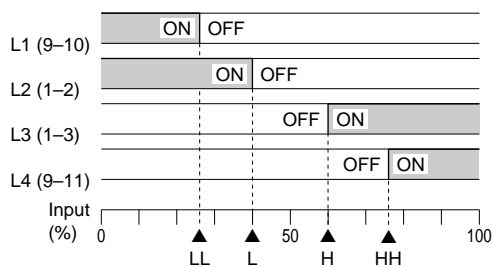
Temperature range

T/C	USABLE RANGE		ACCURACY ASSURED LIMIT	
	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$
(PR)*	-52 to 1860	-61.6 to 3380	150	302
K(CA)*	-272 to 1472	-457.6 to 2682	-200	-328
E(CRC)*	-272 to 1020	-457.6 to 1868	-200	-328
J (IC)	-260 to 1300	-436 to 2372	-260	-436
T(CC)*	-272 to 500	-457.6 to 932	-200	-328
B(RH)*	24 to 1920	75.2 to 3488	450	842
R*	-100 to 1860	-148 to 3380	150	302
S*	-100 to 1860	-148 to 3380	150	302
C(WRe 5-26)	-52 to 2416	-61.6 to 4381	-52	-61.6
N	-272 to 1400	-457.6 to 2552	-200	-328
U	-252 to 600	-421.6 to 1112	-252	-421.6
L	-252 to 1000	-421.6 to 1832	-252	-421.6
P (Platinel II)	-52 to 1496	-61.6 to 2725	-52	-61.6

*For temperatures ranges near lower limit of the usable range, the transmitter may not satisfy the described accuracy.

■ **OUTPUT**

Alarm Trip Operation Example with quad N.O. contacts (LL, L, H, HH); Terminal No. in parentheses



Trip Operation in Power Failure

- **Output Code 2:** all relays turn OFF.
- **Output Code 3:** all relays turn ON.
- **Output Code 5:** Terminals 1 – 3, 9 – 11 turn ON.

• **Quad Alarm**

Relay rating: 120V AC @1A (cos ϕ =1)

240V AC @0.5A (cos ϕ =1)

30V DC @1A (resistive load)

electrical life 10⁵ cycles (rate 30/min.)

Maximum switching voltage: 380V AC or 125V DC

Maximum switching power: 100VA or 30W

Minimum load: 5V DC @10mA

Mechanical life: 5 \times 10⁷ cycles

• **Dual Alarm**

Relay rating: 120V AC @5A (cos ϕ =1)

240V AC @2.5A (cos ϕ =1)

30V DC @5A (resistive load)

electrical life 10⁵ cycles (rate 30/min.)

Maximum switching voltage: 380V AC or 125V DC

Maximum switching power: 500VA or 150W

Minimum load: 5V DC @10mA

Mechanical life: 5 \times 10⁷ cycles

INSTALLATION

Power input

AC: operational voltage range 85 – 264V;
47 – 66 Hz, approx. 6VA

DC: operational voltage range for R: 24V \pm 10%
or P: 85 – 150V;
approx. 3.5W (ripple 10% p-p max.)

Operating temperature: -5 to +55 $^{\circ}\text{C}$ (23 to 131 $^{\circ}\text{F}$)

Operating humidity: 30 to 90% RH (non-condensing)

Mounting: surface or DIN rail

Dimensions: W50 \times H87 \times D132 mm (1.97 \times 3.43 \times 5.20")
See General Spec. Sheet Figure C-2.

Weight: 500 g (1.1 lbs)

PERFORMANCE in percentage of FS input

Setpoint accuracy (trip point accuracy):

\pm (0.1% of FS + 1 digit)

Display accuracy: \pm (0.1% of FS + 1 digit)

Cold junction compensation error: \pm 0.5 $^{\circ}\text{C}$ or \pm 0.9 $^{\circ}\text{F}$
maximum (at 20 $^{\circ}\text{C}$ \pm 10 $^{\circ}\text{C}$ or 68 $^{\circ}\text{F}$ \pm 18 $^{\circ}\text{F}$)

Temp. coefficient: \pm 0.015%/ $^{\circ}\text{C}$ (\pm 0.008%/ $^{\circ}\text{F}$)

Response time: \leq 1.5 seconds (0 – 100% at 90% setpoint)

Burnout response: \leq 5 seconds

Line voltage effect: \pm 0.1% over voltage range

Insulation resistance: \geq 100M Ω with 500V DC

Dielectric strength: 2000V AC @1 minute

(input to output to power to ground)

STANDARDS & APPROVALS

CE conformity: EMC Directive (89/336/EEC)

EMI EN61000-6-4

EMS EN61000-6-2

Low Voltage Directive (73/23/EEC)

Installation category II

Pollution degree 2

Max. operating voltage 300V

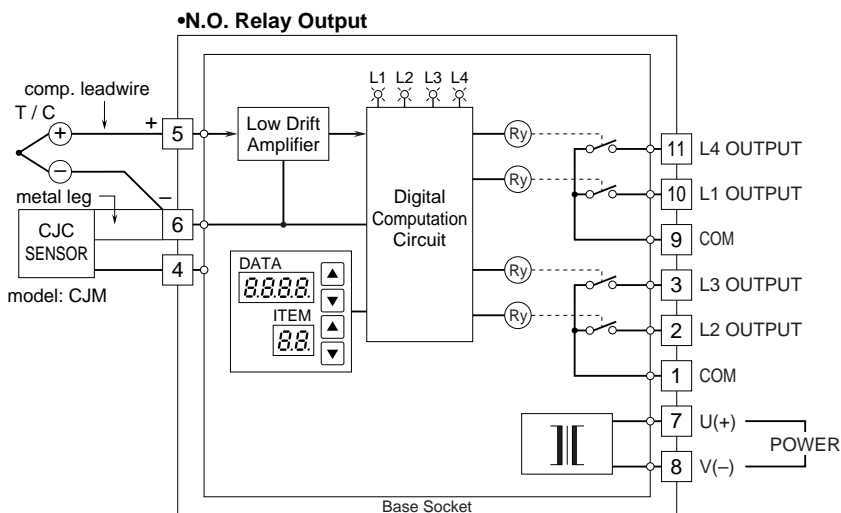
Input to output to power – Basic insulation

Approval: UL/C-UL general safety requirements

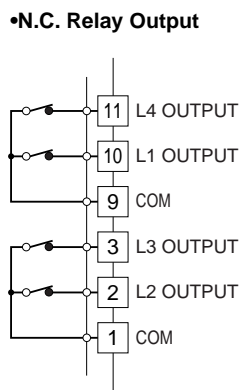
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SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

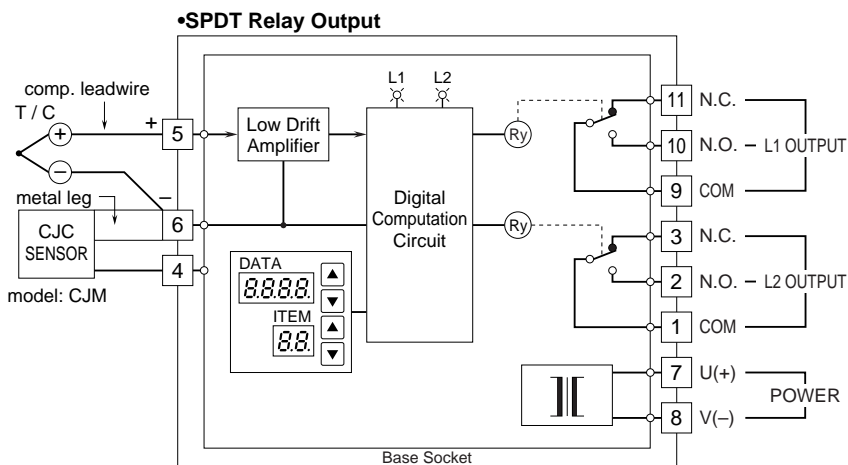
■ OUTPUT SUFFIX CODE: 2



■ OUTPUT SUFFIX CODE: 3

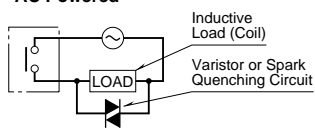


■ OUTPUT SUFFIX CODE: 5

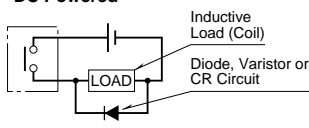


■ Relay Protection

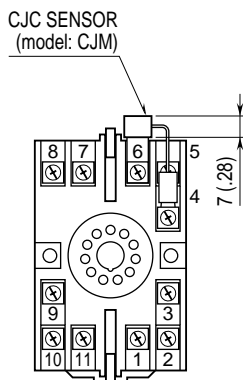
•AC Powered



•DC Powered



TERMINAL ASSIGNMENTS mm (inch)

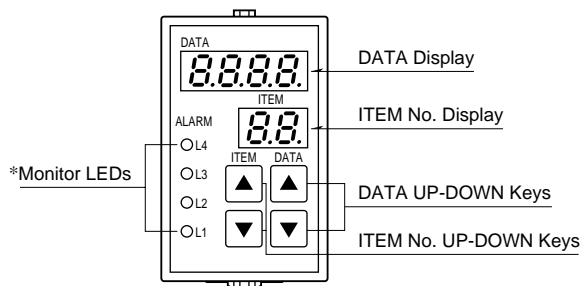


FRONT PANEL CONFIGURATION & PROGRAMMING

PROGRAMMING PROCEDURE

1. Press ITEM UP or DOWN key until ITEM display indicates "01".
2. Press DATA UP or DOWN key and choose "1" or "2" on DATA display.
 - 1 : Only alarm setpoints are modifiable.
 - 2 : All parameters are modifiable.
3. Press ITEM UP or DOWN keys until ITEM display shows the ITEM No. you need to change.
4. Press DATA UP or DOWN key and choose a DATA No. or value you need on DATA display.
5. Repeat above 3 and 4. (Entered data is stored when you move to a new ITEM.)
6. Press ITEM UP or DOWN key until ITEM display indicates "01".
7. Press DATA UP or DOWN key and choose "0" on the display.
8. Press ITEM UP or DOWN key until ITEM display indicates "P". DATA display shows process input. You can now check data setting by choosing ITEM No.

Note: DO NOT press UP and DOWN keys simultaneously.



*L3 or L4 does not turn on for dual output type.

ITEM	MDF. CODE	DATA	CONTENTS	DEFAULT SETTING
P	N/A	-272 – 2416* ¹	Process input display in engineering unit	— * ¹
L1	1, 2	-272 – 2416* ¹	L1 setpoint in engineering unit	Quad: 20.0 Dual: 20.0* ¹
L2	1, 2	-272 – 2416* ¹	L2 setpoint in engineering unit	Quad: 30.0 Dual: 80.0* ¹
L3	1, 2	-272 – 2416* ¹	L3 setpoint in engineering unit* ²	Quad: 70.0* ¹
L4	1, 2	-272 – 2416* ¹	L4 setpoint in engineering unit* ²	Quad: 80.0* ¹
01		0, 1, 2	Modification code 0 : Data indication only. 1 : Only ITEM L1 – L4 are modifiable. 2 : All parameters are modifiable.	1
02	N/A	0 – 99	Status indication ("0" is normally indicated.) 0: Normal 1: Memory error 10: Out of input range -15 – 115%	
03	N/A	3	Input type code	
04	2	0 – 99	Power ON-delay time (seconds)	5
05	2	0 – 99	ON-delay time (seconds)	0
06	2	0, 1, 2, 3, 4	Moving average (sampling cycle: 100 msec.) 0: No, 1: 4 samples, 2: 8 samples, 3: 16 samples, 4: 32 samples	0
07	2	0, 1	L1 trip operation (0 : Lo, 1: Hi)	Quad: 0 Dual: 0
08	2	0, 1	L2 trip operation (0 : Lo, 1: Hi)	Quad: 0 Dual: 1
09	2	0, 1	L3 trip operation (0 : Lo, 1: Hi)* ²	Quad: 1
10	2	0, 1	L4 trip operation (0 : Lo, 1: Hi)* ²	Quad: 1
11	2	-1, 0, 1 – 60	Power-saving mode -1 : Continuous display upon startup 0 : Continuous display after the last access 1 – 60 : Minutes before display turned off after the last access	10
12	2	0, 1	L1 coil at alarm (0: Energized, 1: De-energized)	0
13	2	0, 1	L2 coil at alarm (0: Energized, 1: De-energized)	0
14	2	0, 1	L3 coil at alarm (0: Energized, 1: De-energized)* ²	0
15	2	0, 1	L4 coil at alarm (0: Energized, 1: De-energized)* ²	0
16	N/A	—	Version No. indication	—
17	2	0.0 – 2416* ¹	L1 hysteresis (deadband) in engineering unit	1.0
18	2	0.0 – 2416* ¹	L2 hysteresis (deadband) in engineering unit	1.0
19	2	0.0 – 2416* ¹	L3 hysteresis (deadband) in engineering unit* ²	1.0
20	2	0.0 – 2416* ¹	L4 hysteresis (deadband) in engineering unit* ²	1.0
21	2	0, 1	Burnout protection (0: Downscale, 1: Upscale)	1
22	2	-272 – 2416* ¹	Upper range temperature limit Display flashing with higher temperature	999.9* ¹ PV flashing at upscale burnout.
23	2	-272 – 2416* ¹	Lower range temperature limit Display flashing with lower temperature	-100.0* ¹ PV flashing at downscale burnout.
24	2	0, 1, 2	Temperature unit (0: °C, 1: °F, 2: K)	0
25	2	0 – 12	Thermocouple type 0: (PR), 1: K (CA), 2: E (CRC), 3: J (IC), 4: T (CC), 5: B (RH) 6: R, 7: S, 8: C (WRe 5-26), 9: N, 10: U, 11: L, 12: P (Platinel II)	1 (K or CA)

*1. According to the temperature unit specified in ITEM 24. *2. Quad alarm trip type only