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User's Guide

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CN1A series on/off temperature controller

FRONT PANEL FUNCTIONS

SET

When momentarily pressed, enables the set point to be viewed. When held for >4 secs, enables access to the set point. When adjusting the set point, scrolls from left to right across each digit. When in programming mode, scrolls through parameters and, for selected parameter, scrolls from left to right across.

△

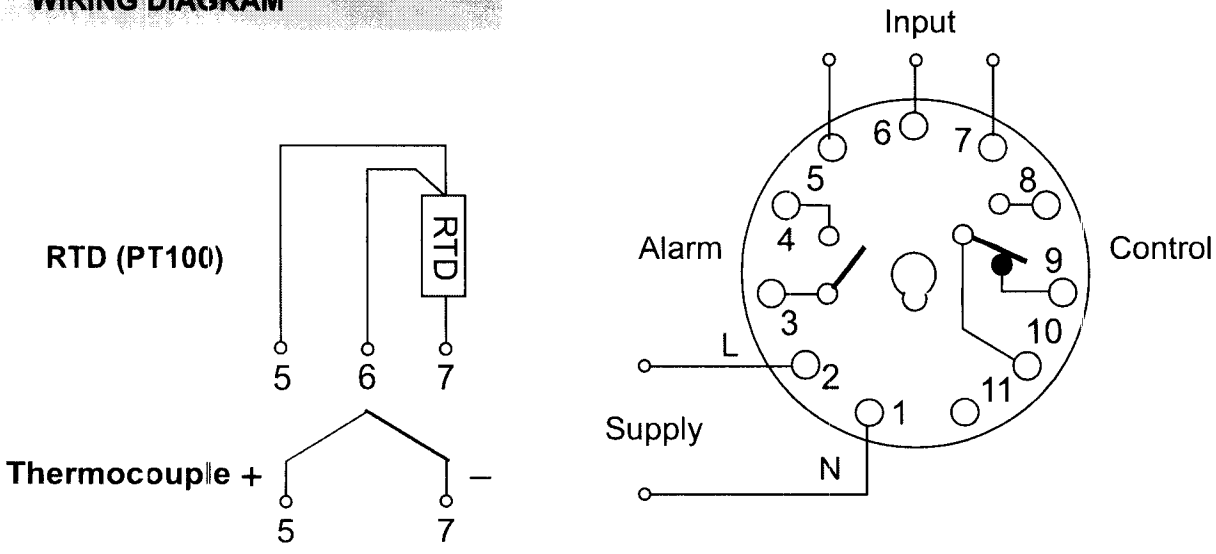
When adjusting the set point, increments the value of each digit selected by the SET key. When in Programming mode, increments the variable of parameters or digits selected by the SET key.

START-UP PROCEDURE

With a suitable probe connected to the CN1A , when the supply is first applied, the display will go through the start-up routine of displaying the software issue (e.g. 5.2) followed by a display check (*888*) and then by the measured value (usually ambient temperature). It is advisable not to connect a load initially, as the Controller will attempt to control against the default values set at the factory.

After accessing the set point (by holding down SET for > 4 seconds) and adjusting it to the desired process value, the CN1A will display *CdE*. The code 410 must then be entered to access the other programmable parameters; otherwise, if no other adjustments are required, a further press of SET will return the display to the process value. For details of how to program the CN1A , see the program flowchart.

WIRING DIAGRAM



INSTALLATION

Locate the instrument where it will not be subject to excessive temperature, shock or vibration.
Do not overtighten the two mounting collar fixingscrews when locating the controller into a panel.
Do not run thermocouple or other input wiring in the same conduit as power leads.
Make sure the input sensor (J, K, T, N thermocouple or RTD) matches the type of unit supplied.
Always use thermocouple extension cables of the same type as your thermocouple probe.

CHANGING THE SET POINT

1. To view the set point, press the SET key momentarily.

2. To change the set point, press and hold the SET key for at least 4 seconds until the first digit flashes. Press the Λ key to increment digit. Press the SET key for 2nd and 3rd digits. Press the SET key to display CdE and again to return to the measured value.

PROGRAMMING PROCEDURE

1. At CdE press the Λ key to display 000 with the first digit flashing.

2. Use the Λ and SET keys to set the password (default 410). Press SET again to enter the program mode.

3. The SET key scrolls through the program parameters and the Λ key will change a parameter. When in a parameter with a value the SET key scrolls across the digits from left to right.

4. See the program flowchart and parameter table for full program parameter information.

ERROR HANDLING

Each time the UNI/4 is powered-up, the software checks the two portions of memory which contain the user parameters and calibration constants. If the controller is subjected to excessive electrical noise, either or both of these sets of parameters may become corrupted. In this case the following corrective actions must be taken:

USER PARAMETER CORRUPTION

Once corrupted, the controller will immediately switch it's output off and then reset the user parameters to the default values, warning the operator by flashing *SEt* on the display. By pressing SET the display will change to *CdE* and the default password (410) can be entered to access the set-up routine. Please refer to the program flowchart for programming details. The default values can also be set at any time by pressing both keys when CdE is displayed. The display will change to DEF press Λ key to display "no" and again for "yes". Then press the SET key.

CALIBRATION CORRUPTION

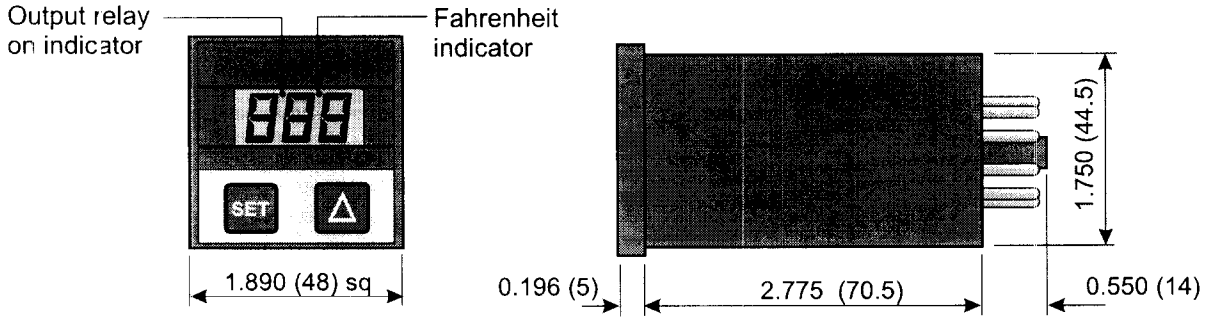
The calibration routine can be entered by pressing both buttons for more than 4 sec's the display will read CAL. Press the Λ key twice to display "yes". Press Set this number is the ambient temperature in Celsius adjust if necessary. On the final SET the display shows "CLL" set input simulator to 0°C and press SET. The display should show a value close to 0 and after pressing SET again it should be closer. Press SET and the display will show "CLH" set the input simulator to 900°C and press SET. The display will now show the high value and after pressing SET again it should be closer to 900. This procedure can be repeated until correct, then with either "CLL" or "CLH" on the display press both keys together until the unit re-starts. The PT100 version is similar except there is no ambient temperature setting and it should be calibrated at 0°C(100 Ohms) and 300°C (212 Ohms)

Note: This procedure should only be attempted by trained personnel and only where the premises has the facilities for simulating calibrated temperature references. Otherwise the unit should be returned to the Omega Engineering.

SPECIFICATION

Supply voltage:	10 - 32Vac/dc @ 60mA max. 90 - 260Vac, 50/60 Hz @ 1.5VA max.
Sensor options:	J, K, T, N T/couples, PT100.
Scale ranges:	J T/c = -99 to 700°C (999°F) T T/c = -99 to 300°C (570°F) K/N T/c = -99 to 999°C or F PT100 = -99 to 400°C (700°F)
Gain accuracy:	T/c = +/- 0.25% of scale range Others = +/- 0.6% of scale range
Offset accuracy:	T/c = +/- 5°C PT100 = +/- 2°C
Outputs:	Control: 3A @ 240Vac, SPCO relay Alarm: 3A @ 240Vac, SPNO relay
Approvals:	Conforms to CE generic standards EN50081-1 and EN50082-1 for emc and EN61010-1 for low voltage
Ambient range:	-10 to 50°C non-condensing
Memory back-up:	EEPROM
Weight:	150 gms

DIMENSIONS



Panel cut-out 1.772 X1.772 (45 x 45)

Dimensions in inches (mm)

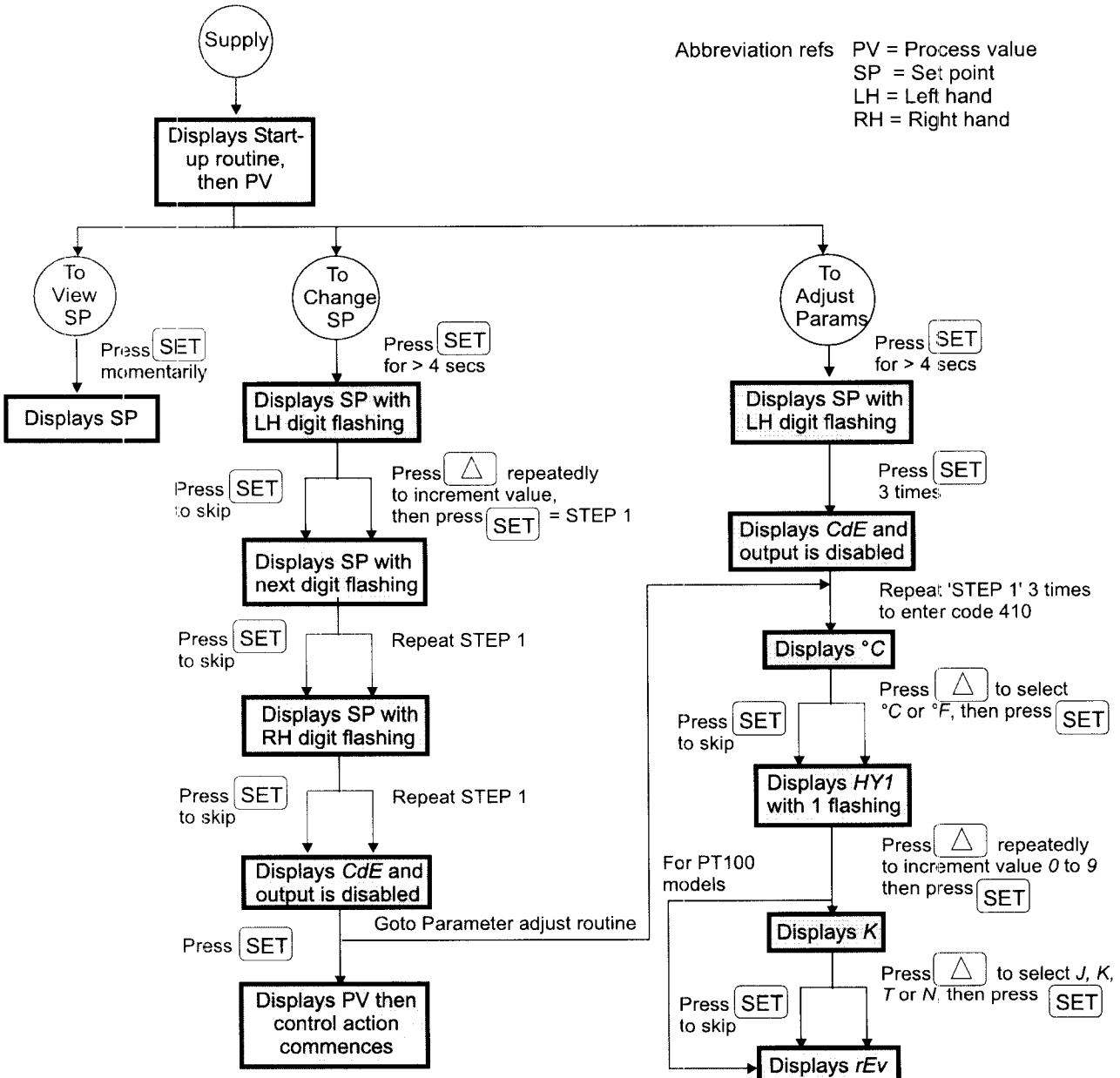
PARAMETER TABLE

Parameter	Display Code	Default Value	Range or options	Function/Comments
Scale units	°C	°C	°C, °F	
Hysteresis	HY*	HY1	HY0 to HY9	Determines the band over which the On/Off control function operates. For HY0 the controller operates as a latch forcing the ouput permanently off when the set value has been reached, until the supply is removed.
Sensor Type	H(K)	K	K, J, T, N	Ensures compatibility of the controller with the applied sensor. This parameter is automatically skipped for PT100 models.
Control Action	rEu	REV	REV, DIR	Selects the type of control action: reverse for heating, in which the output is on below the set-point(SP), and direct for cooling, where the output is on above the set-point (SP).
Deviation Alarm	dEu	00	00 to 99	Sets the value, above or below the SP, at which the alarm output is activated. For this mode, the alarm always tracks the SP. When set to 00 the deviation alarm function is inactive.
High Alarm	ALH	999	SP to 999	Sets a value above which the Alarm output is activated. This value is independent of the SP.
Low Alarm	ALL	-99	-99 to SP	Sets a value below which the Alarm output is activated. This value is independent of the SP.
Alarm Action	AL*	0	0 to 9	This parameter provides three functions:- 1) To determine the status of the Alarm contacts when an Alarm condition is satisfied (Note: the de-energised state of the alarm relay is normally open (N-O)). 2) To decide the symmetry of the Deviation Alarm. For AL0 to AL3 the Deviation Alarm band is 2 X dEv setting. For AL4 to AL9, the Alarm band is asymmetrical and dependent upon the Control Action. 3) To decide whether the Alarm output is active immediately, at power-up, or inhibited until after the process has first reached the SP.

Code	Contact status in alarm state	Alarm action	Deviation Alarm Band	
			reverse	direct
AL0	Closed	Inhibited	Symmetrical	
AL1	Open	Inhibited	Symmetrical	
AL2	Closed	Immediate	Symmetrical	
AL3	Open	Immediate	Symmetrical	
AL4	Closed	Inhibited	Low	High
AL5	Open	Inhibited	Low	High
AL6	Closed	Immediate	Low	High
AL7	Open	Immediate	Low	High
AL8	Closed	Inhibited	High	Low
AL9	Open	Inhibited	High	Low

Set-point High	SPH	999	SP to 999	Sets the limit above which the SP cannot be adjusted.
Set-point Low	SPL	-99	-99 to SP	Sets the limit below which the SP cannot be adjusted.
Reset	rES	00	-99 to +99	Sets a +ve or -Ve offset to compensate for sensor differences or unavoidable process errors; such as displacement between sensor and desired control point temperatures.
Password	PAS	410	-99 to 999	Provides a means of restricting access to program parameters by unauthorised personnel. When set to any number >500, the Set-point can be viewed but not adjusted. **Warning!! If the password is amended then forgotten, see paragraph "USER PARAMETER CORRUPTION".**

PROGRAM FLOWCHART



Programming Notes:

1) *SPH* and *SPL* are used to fix the set point limits.

2) For a description of the parameters, see the table (left).

3) If no keys are pressed for 30 seconds, the *conf* will automatically return to the control mode without entering the new parameters.

4) The SET key may be held for > 4 secs at any time during programming to enter only fully modified parameters.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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