CAL 3200 Setting Up Instructions   ①

3200 Control of Heat - Cool Applications

Explanatory Notes

This method uses the factory PID settings to control the Initial warm up to normal machine operating temperature, then uses Autotune At SP to calculate and automatically implement new values into HEAT (SP1) channel.

The values for proportional band and cycle time can then be read from the programme and used for setting the COOL (SP2) channel.

This initial configuration of SP2 will cause further temperature fluctuations which should be left to settle out.

On multizone applications, eg. extruders, errors due to thermal interaction between zones can be avoided by initiating Autotune on all zones simultaneously.

Consult 3200 Operating Manual for steps : 1,2 and 3 listed below.

1 Initial configuration   (Section 6.2.1 to 6.2.7)

2 Autotune at setpoint (tunE At SP) then: (Section 7.1.2 then 7.2.3)
     When complete (tune At SP stops flashing)

3 Select Autotune calculated cycle time   (Section 9.4.1 to 9.4.5)
     (Check that control In Heat Only is acceptable.)

Then consult these notes to:

4 Read and note Autotune Values for :   (Page 3 of these notes.)
     Heat prop - band and cycle time

5 Configure Cool Channel   (Page 3 and 4 of these notes.)

6 Fine tuning or Water Cooling   (Page 4 of these notes.)

2. Typical Connections.

Example A. **The SSd output is allocated to SP1 and wired to switch the load (heater) using an SSR.**

Cooling Fan / Solenoid
is switched by SP2 relay output.
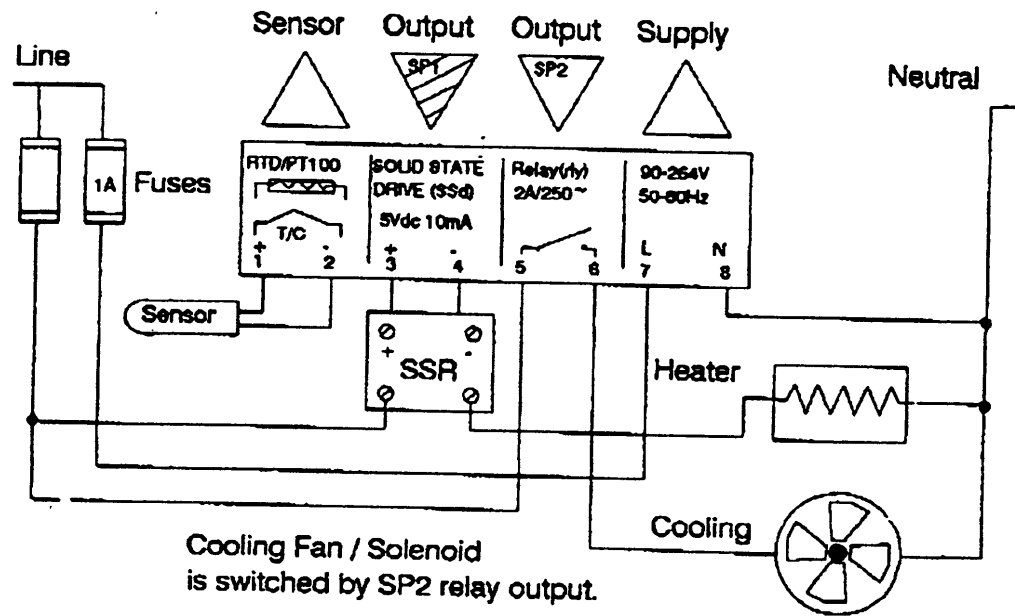
Example B **The relay output is allocated to SP1 and wired to switch the load (heater) using a contactor**

The Cooling Fan / Solenoid is switched by
SP2 Ssd output via an SSR
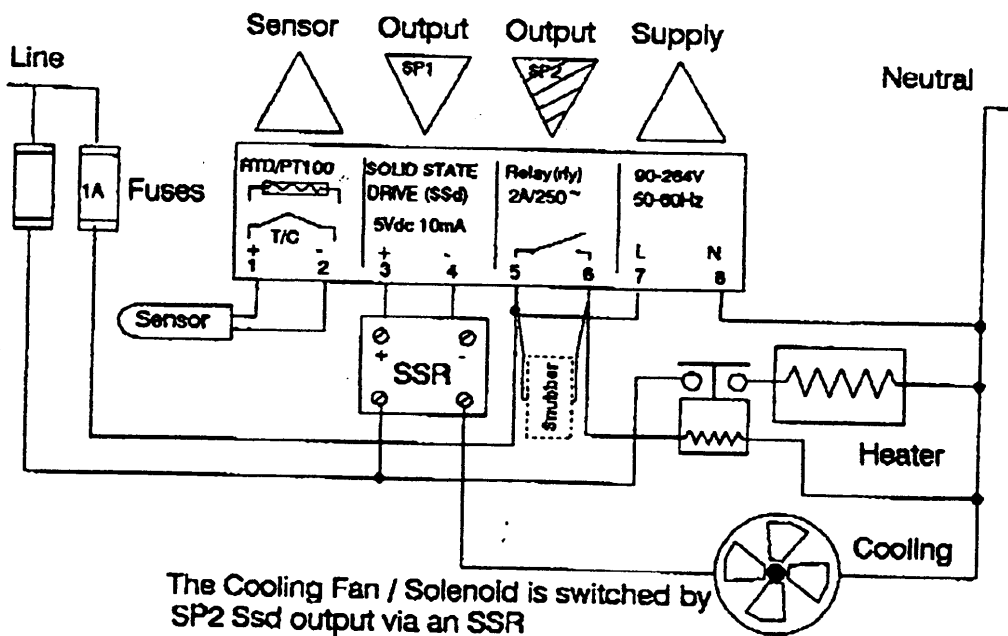
**4 Read and note Autotune Values
for : Heat prop band and cycle time.**

5 Configure Cool Channel

4.1 To enter programme mode from normal
operating mode.

Press and hold ▲ ▼
for 3 seconds

Enter programme mode at | tunE |
Function on level 1.

Release both ▲ ▼ together.

5.1 Index to bnd2

Press ▲ 4 times.

4.2 To check value of bAnd -
Press ▲ once.

Autotune calculated
value indicator.
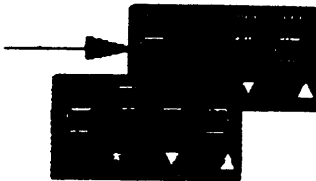
e.g. bAnd value 5.2

Actual bAnd value .... C / F

5.2 Set bnd2 same as bAnd e.g 5.2

Press ✱ and hold

Press ▲ and hold
to increase to 5,2   Release ✱ ▲

5.3 Index to CYC.2
Press ▲ once

4.3 To check value of cycle time.

Press ▲ 4 times.

e.g. CYC.t value 16 sec.

Actual CYC.t value .... secs

5.4 Set CYC.2 same as CYC.t e.g. 16sec

Press ✱ and hold

Press ▲ and hold
to increase to 16 sec.   Release ✱ ▲

5.5 To select cool mode (Level 2)
Press ▼ and hold until 'LEVL ' appears.
Release   to display current Level.

5 Configure Cool Channel (continued)

5.6 Press and hold*
Press ▲ to increase LEVL (2)
(or press ▼ to decrease Level.)

Release * to display
the new Level (2)

5.7 Index to SP2.A
Press ▲ 5 times.

Select (Cool)
Press * and hold.
Press ▲ 6 times

5.8 Exit programme mode.
Press ▼ ▲ for 3 sec.

> Controller now operational
> with PID output for both
> Heat and Cool channels.
>
> Note! The configuration of
> SP2.A/Cool may cause
> a temporary disturbance.
>
> Allow temperature to
> stabilise before running
> the process.

6 Water Cooling

For Water Cool applications
above 100 C where flash to
steam occurs.

Select non linear cool
proportional band
in Level (2)   SP2.b

Further Adjustments

If oscillation occurs during
cooling -

Double Cool proportional band:
        LEVL (1) : bnd.2

Halve Cool cycle time:
        LEVL (1) : CYC.2

Introduce Cool overlap / deadband.
        LEVL (1) : SEt.2

Settings are in C / F
Overlap   (-)ve values
Deadband   (+)ve values

If oscillation still occurs
double values simultaneously for:

Cool prop. band
        LEVL (1) : bnd.2

Heat prop. band:
        LEVL (1) : bAnd

Integral time:
        LEVL (1) : int.t

**If this fails to give good control:
Call CAL**