

CE

**USER & ENGINEER
INSTRUCTION
MANUAL**



**BENSON
CP4**

USER INSTRUCTIONS

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Please consult the manual shipped with the heater for detailed wiring connections.

CP4 BASIC SETTING GUIDE

INITIAL SCREEN ON RECEIPT. The display will show either of the following:

DAY: TIME: INITIAL TEMP SETTING HEAT OFF or

DAY: TIME: and the letters **N/C HEAT OFF**

At this point the control will require calibration. (A separate thermostat showing the actual temperature would be an advantage for the calibration).

Calibrate by the following method:

Press **PROG** and key in the engineers code (**6343**) and press **ENTER**.

The display shows 4 options - press **4 (SETUP)**. A further 4 options are displayed. Press **3 (SENSOR)**. Display shows **INTERNAL SENSOR N (0) Y (1)** press **1** and **ENTER**. Screen shows calibrated **INTERNAL XX** and a temperature, key in the correct temperature and press **ENTER**. The screen will now display calibrate **N/C REMOTE 1 XX** (calibration of this screen is only required when using a remote sensor) for normal use with internal sensor press **RUN three times** and screen will indicate **ADJUSTING SETUP PLEASE WAIT**. The display will then indicate:

DATE: TIME: TEMP HEAT OFF

INITIAL SCREEN SETUP END USER

The end user programme settings can now be programmed as follows:

Press **PROG** key in operators code (**0000**) and press **ENTER** to access the options screen.

TEMPERATURE SETTING

To enter the temperature required the display shows 4 options - press **1 TEMP** and set the temperature required. Press **ENTER**. The display shows **FROST PROTECTION 1 ON 2 OFF**. If frost protection is required press **1**. Screen shows **SET NIGHT PERIOD TEMP (04°C)** this setting can be changed if required. If not press **ENTER** to return to the 4 options screen.

OPERATING TIMES

To enter the times that the heater will be required to operate there are 3 ON/OFF times per day available if required. The 24 hour clock system is used. If a mistake is made press **RUN** to return to options screen.

On the options screen press **2 DATA** and the screen will display **MON PERIOD 01 S HH:MM E HH:MM**. Key in the required start time (**S**), e.g. 0700 and press **ENTER**. Key in end time (**E**), e.g. 1630 and press **ENTER**. The screen will now display **DAY PERIOD 02** and a further switching time can be programmed in if required. Press **ENTER** and **DAY PERIOD 03** will be displayed. **IF NEITHER OF THE PERIODS 02/03 ARE REQUIRED AFTER PERIOD 01** just press **ENTER** for those periods.

The screen will now show **TUE PERIOD 01**. If the switching time is the same for Tuesday as it was for Monday, press the **PROG** (copy) button and the programme will automatically copy the information over. It will do this for all the days of the week. If alternative times are required they can be keyed in. If not, press **ENTER** for that day.

DAY AND DATE

On 4 options screen press **3 SYSTEM** then press **1 SYSTEM TIME** key in the correct time and press **ENTER**. The screen will change to DATE. Key in date and press **ENTER**. Screen will display SET DAY OF WEEK 1=MON 7=SUN, press the correct number for the day of the week. Screen will change to 2 option screen, press **RUN** twice to return to main display screen.

SWITCH OFF HEATER

To switch **OFF** the heater at any time during normal programmed operation press **OVER/STANDBY** button then press **2 STANDBY MODE**. If the heater is operating, the burner will shut down and the heater will go through its shut down sequence and switch **OFF**.

To switch the heater **ON** press **OVER/STANDBY** button then press **2 STANDBY MODE** the heater will switch back to normal operation.

SYSTEM OVERRIDE

To switch the heater **ON/OFF** for a short period outside programmed operating times press **OVER/STANDBY** button then press **1 OVERRIDE MODE**. This will show 2 options, **OVERRIDE 1 On 2 OFF**.

If heater is **OFF** as it is outside its timed programme and you wish to run the heater for a short period press **1** and enter the number of hours you wish to operate in override mode (the default setting is 4 hours but this can be changed through the engineers settings options).

When set, the display will flash periodically and count down the override time. The same operation can be done by press **2** if the heater is **ON** and you wish to turn it off for a specific period.

Before returning to the normal operating period ensure that the override time entered in the overrun period is deleted.

Standard Terms

Self Learning Optimisation is a system whereby the Benson CP4 will automatically calculate the start up time to ensure the building is up to temperature for the programmed switching time. It does this by monitoring the internal temperature readings, so that for example, in milder weather conditions heat up times are reduced - thus saving energy.

Preheat is the number of hours the control can come on before the programmed switching time (when in optimising mode) This is setup under the Engineers code and can be set to no more than 8 hours.

Rate of Change is the time it takes to raise the building by 1 °C. The factory default for this setting is 20 minutes but the control will automatically adjust this according to the fabric of the building.

Override Using the override button on the Benson CP4 keypad allows the user to override the zone for a selected number of hours, to allow for unscheduled use of the system. A maximum can be set to stop users entering long override periods.

Switching period status:

- **Day** is when the control is being controlled to an actual switching time (For example between 07.00 - 17.00 the control would be in a DAY condition) Outside of these hours the control would be in a night condition.
- **Night** is when no switching times have been programmed. At these times the control is set back to the night temperature or frost protection.

Heater Lockout and Reset is standard on the CP4 and allows for a signal to be fed into the CP4 from the heater when the heater goes to lockout. **Once the fault on the heater has been rectified** a reset signal can be sent to the heater resetting lockout status.

Normal RUN Mode is when the control is operating normally and is not being programmed (ie showing the time and date screen). It is important to remember that when any alterations have been made to the CP4's program, the RUN button is pressed to return the control to the RUN mode.

Normal RUN Mode

There is one main Normal (Run) mode screen, and one Info screen on the Benson CP4. These are explained below;

On/Off RUN mode screen

FRI 07.58 23°C HEAT OFF

This screen shows the time, actual temperature and the heat relay status (On or Off)

High/Low RUN mode screen

FRI 07.58 23°C LOW ON HIGH OFF

This screen shows the time, actual temperature and the heat status of both high and low flame

Pressing the Information button followed by option 1 will show the following display:

This display shows the target temperature along with the switching period status.

TARGET TEMP : 21°C TIME CLOCK: DAY

Override

The Benson CP4 can be overridden into a day or night condition to allow for any unscheduled operation of the system. The maximum time that the unit can be overridden will have been set by the installer.

To program an override period

- From the Normal RUN mode
Press the Override button and enter your security code if required.
- Then choose 1) to enter the override mode
- Then select either 1 or 2 to override the zone
ON(1) or OFF(2)
- You are now prompted to enter the length of the override period.
- Should the zone be above temperature, the control will show the following screen. Remember that the override function only overrides time and not temperature. This error message will also appear if the override time programmed exceeds the maximum override setting
- The status screen then indicates the zone has been put into an override condition.

Mon 13.06 20°C
Time Clock: DAY

1> OVERRIDE MODE
2> SUMMER MODE

OVERRIDE TO
1> ON or 2> OFF

OVERRIDE SETTING
MAXIMUM (04) :03

** WARNING**
INVALID DATA

Mon 13.06 20°C
Status: OVERRIDE



To cancel an override period repeat the steps above, choosing 2 for OFF and then reduce the length of the override period to 00

Standby Mode

In order to put the CP4 into Standby mode, press the Override/Standby button and select 2 for Standby.

The control is then put in to the Standby mode, which means that the temperature is controlled to the night setback setting.

To cancel repeat the above operation.

1> Override
2> Standby

Date

To display the current time and date:

- Press INFO
- Press 2 for date.
- To cancel, repeat the above operation.

12.13.49
SAT 11-12-02

Heater Lockout/Reset

A supply can be wired into the Benson CP4 from the heater lockout connection allowing for remote indication of a fault. **Once the fault on the heater has been rectified**, pressing RESET on the keypad sends a reset signal to the heater to clear the lockout status. This feature is highly beneficial on heaters installed out of reach.

Heater Reset (No lockout indication)

On heaters where there is no heater lockout indication, the Benson CP4 can be used to send a reset signal.

To send a Reset signal in the case:

- Press the Info/Reset button
- Press 3 for Reset

1> INFORMATION 2>DATE
3> LOCKOUT RESET

The reset relay will be energised for a second.

Manual Summer Fan

Providing the installed heaters are equipped with a summer fan facility, the Benson CP4 can enable the fan to give ventilation in summer months.

- Pressing the FAN key displays the following screen.
- At this point you must press ENTER or if you wish to abort this operation press the DELETE key.

FAN ON?
ENTER TO CONFIRM

! To disable the fan, repeat the above operation.

If the FAN key does not operate, the fan output is being used to give constant or automatic summer fan control. This is described later in this manual.

Program Mode

From the Normal (RUN) mode screen, pressing the PROG button will display the following screen.

** WARNING **
ENTRY CODE: ????

Before you can access the Benson CP4 you must enter the passcode. This passcode is set to 0000 as a factory default but may be changed at any time by the user to ensure security. This process is explained under section 4 (code).

Temp

This section is used to change the temperature settings.

1> TEMP 2>DATA
3>SYSTEM 4>HOLS

Pressing 1 for Temp displays the following screen:

- You are now prompted to enter the required temperature for the DAY periods (EG:22). This must be entered as two digits.
- When complete, press Enter
- You are now able to select whether you require frost protection. Selecting ON enables you to set a NIGHT setback temperature.
- Press Enter when you have set the required night temperature.

SET DAY PERIOD
TEMP: 22°C

FROST PROTECTION
1>ON or 2>OFF

SET NIGHT PERIOD
TEMP: 05°C

If S.Fan has been enabled, you are prompted to enter the summer fan temperature. The summer fan temperature is calculated by a differential setting. For example a differential of 03 means that the summer fan temperature will be 03°C above the day setting. Therefore there is no risk of the DAY temperature being higher than the Summer Fan setting.

SUMMER FAN
DIFFERENTIAL: XX

Data

The DATA section is where you are able to set the daily switching periods. There are 3 switching periods per day available.

- Press PROG and enter the security code
- Now select 2 to enter the DATA menu.

1>TEMP 2>DATA
3>SYSTEM 4>HOLS

You can see on screen now that we are prompted to enter the switching period 1 for Monday. So using 24 hour clock notation, enter the required start time. (EG: 08.00)

MON PERIOD 1
S:HH:MM E:HH:MM

Now press enter to accept the Start time and to move the cursor to the end time setting.

We are able to program the required End time, for example 17.00. Don't forget to use 24 hour clock notation. When complete, press Enter to accept the programmed switching time and to move onto period 2 Monday.

Programming further periods

You are now able to program period 2 Monday in just the same way. Press Enter when complete.

MON PERIOD 2
S: HH:MM E:HH:MM

Should you not require all three switching periods, simply leave the times at HH:MM and this period will be ignored.

MON PERIOD 3
S: HH:MM E:HH:MM

At this point press the Enter key to move onto Tuesday's switching periods.

You are able to enter the switching periods for Tuesday in just the same way.

TUE PERIOD : 1
S:HH:MM E:HH:MM

Should the switching periods be the same on Tuesday, you can press the COPY button and this copies all of the switching times from the previous day. So, for example, if you were to press the COPY button on Tuesday period 1 all of the switching times from Monday would be copied, and then the Benson CP4 would move onto Wednesday.

A screen is displayed to indicate the time have been copied.

COPYING ALL DATA
MON to TUE



To correct any mistakes made, use the DEL Key. If Enter is pressed at any time then the current settings will be retained.

System

This section allows you to set the system time/date and the security codes for the system.

System Time

- From the Normal RUN mode press PROG and enter the user security code.
- Press PROG and enter the user code
- Now press 3 for System
- Now press 1 for System time
- You are now prompted to enter the new time (Enter this in 24 hour clock notation)
- When you have entered the new time, press the Enter key.
- You are now prompted to enter the System date. (Date format is DD:MM:YY)
- When you have entered the new date, press the Enter key.
- You are now prompted to enter the day of week.
- When you have entered the new day, press Enter. The control will revert back to the menu screen. Press RUN to return to the normal RUN mode.

1> SYSTEM TIME
2>SYSTEM CODE

TIME NOW: 13.07
NEW TIME: HH:MM

DATE IS: 19-05-03
NEW DATE: DD:MM:YY

SET DAY OF WEEK
1==MON- 7==SUN

System Code

- Press Prog and enter the security code.
- Pressing 3 for System
- Pressing 4 for Code prompts you to select the code you wish to alter.


- 1> Manager Code - This code gives access to all data settings.
- 2> Override Code - This code gives access to the Override and Summer functions.

1> MANAGER CODE
2> OPERATORS CODE

To change the code, simply enter the new code when prompted.

CODE NOW: 0000
NEW CODE:????

Press RUN to return to the Normal RUN mode.

 Setting the Manager and Operators code to the same disables the Operators code.
(ie. No code is required to access the operators section)

Holidays

This is the section used to set the known holiday periods for the year when heating in the zone will not be required.

Five holiday periods can be set. Follow the steps below for instructions on how to set the holiday periods.

- Press the program key and select option 4.
- You are now prompted to enter the holiday period 1. You must enter the start date in the DD-MM-YY format. When you have programmed the start date of the holiday press enter.
- You should now program the length of the holiday. You should calculate the number of days you want the heating off by counting from the first day of your holiday until the last. Now enter the length.
- When the first holiday period is set press the enter key.
- Holiday period 2 will now be displayed.

HOLIDAY PERIOD 1
S:00-00-00 L:00

You should program the remaining holiday periods in the same way. When all of the holiday periods have been programmed the control will revert back to the Data menu.

Important Note:

1. If enter is pressed at any time then the current setting will be retained.
2. To cancel the holiday, put the date to 00.00.00 and length to 00. The holiday will then be cancelled

Engineers Setup

To enter the engineers section, press the program button and enter the Engineers code. (This will be found on a label inside the Benson CP4.)

A display like the one shown will now be displayed.

1> OVERRUN 2> OPTI
3> CODE 4> SETUP

OVER (Override)

This section allows you to enter a limit for the override. Enter two digits (eg:08 hours) and then press enter to accept the setting.

OVERRIDE SETTING
MAXIMUM TIME:08

OPTI (Optimisation)

With the Benson CP4 you are able to set whether optimisation is required (Refer to Terms for further information).

Should you require optimisation select 1 or 0 to disable it.

OPTIMISATION ?
N<O> Y<1> : 1

Selecting NO will return you to the Setup Menu and turns off optimisation. This means the control will switch the heating ON at the programmed switching time and will not allow for any warm up period.

This is the amount of time the heating system takes to raise the building temperature by 1°C. An average starting point would be 20 minutes but because the unit is self learning, it will alter itself by 1 minute per day to adjust to the correct setting.

RATE OF CHANGE
MINUTES /°C: 20

This is the maximum number of hours before the entered switching time that the unit could come on to raise the temperature. The maximum setting is 8 hours but an average setting is 3 hours.

SET PRE-HEAT
MAXIMUM TIME: 03

CODE

The code section will work as normal and is used to set the User's code.

SETUP

This section allows us to configure the control, set the required fan mode, enable or disable the internal sensor and set-up the service mode.

1> CONFIG 2> FAN
3> SENSOR 4> EXTRA

CONFIG (Configuring the Benson CP4)

During the configuration process you will be asked to select the functionality required for the system being controlled.

- Press PROG
- Enter the Engineer code
- Select 4 for Setup
- Select 1 for Config

- You are now prompted to select the control type you require.
ON/OFF = 1 HIGH/LOW = 2

ON/OFF = 1 OR
HILO = 2 : 1

CONFIGURING THE CP4 (ON/OFF TYPE)

PURGE OPTION

You are now prompted to select whether a purge is required. Selecting N here enables you to bypass the next two displays.

PURGE REQUIRED?
N<0> Y<1> : 1

Pre-purge activates relay 3 for the amount of time specified before the heat relay is activated.

PREPURGE TIME
<MINS> :00

Post-purge will activate relay 3 for the amount of time Specified after the heat relay has been switched off.

POSTPURGE TIME
<MINS> :00

DOUBLE IGNITION

Enabling this option gives the following functionality.

When the heat relay is activated for the first time of each switching time, it will switch off after 30 seconds. Then after a further 10 seconds the relay is re-energised and will operate as normal.

This operates at the start of every switching period and is used to ensure that the heater fires when installed in areas where there is a high level of condensation.

DOUBLE IGNITION ?
N<0> Y<1> : 0

If post purge is enabled, the fan will timeout before the heater re-fires.

PROVING SWITCH

You are now prompted to select whether you have a proving switch on the system.

PROVING SWITCH?
N<0> Y<1> :0

When there is a demand for heat, the Benson CP4 looks to check firstly that the proving switch is not made. Relay 3 is then energised giving pre purge if required. The proving switch then makes followed by relay 2 being energised.

When you have completed the configuration procedure you will be returned to the setup menu screen. At this point you can press RUN to return to the Normal RUN mode or you can continue to program the other settings by selecting another menu option.

CONFIGURING THE BENSON CP4 (HIGH/LOW TYPE)

HIGH FLAME BOOST

Enabling this option gives the following functionality.

HIGH FLAME BOOST
N<0> Y<1> :0

Whenever there is a heat demand, both high and low relays are activated. After 1 minute the system checks to see if both high and low relays are required. If the temperature is within the differential programmed, the high flame relay is switched off.

HIGH/LOW DIFFERENTIAL

When the Benson CP4 is being used to control a two stage heater, you must enter the Hi/Lo differential setting.

- You are now prompted to enter the Hi/Lo differential.
- A differential setting of 4 and a required temperature of 20°C means that the control will have low and high flame active until the actual temperature reaches 16°C. At this point, the high flame will be switched off.

ENTER THE HILO
DIFFERENTIAL:04

DOUBLE IGNITION

Enabling this option gives the following functionality.

When the heat relay is activated for the first time of each switching time, it will switch off after 30 seconds. Then after a further 10 seconds the relay is re-energised and will operate as normal.

This operates at the start of every switching period and is used to ensure that the heater fires when installed in areas where there is a high level of condensation.

DOUBLE IGNITION ?
N<0> Y<1> : 0

PROVING SWITCH

You are now prompted to select whether you have a proving switch on the system.

PROVING SWITCH?
N<0> Y<1> :0

When there is a demand for heat, the Benson CP4 looks to ensure that the proving switch is made. The heat outputs (High/Low) will be energised when the switch is made.

SYSTEM SETUP

FAN

The Benson CP4 has three fan modes available.

USER<0> C.FAN <1>
S.FAN <2> : 0

User: In this mode, the user is allowed to manually switch the fan relay on/off by use of the FAN Key.

Constant Fan: On the Benson CP4 there is an option to have a constant Fan output. If enabled the fan relay will be permanently ON during the programmed switching times and will operate to the optimiser setting.

Summer Fan: Allows the user to enter a summer fan differential. This setting is the number of degrees above the DAY temperature that the summer fan relay will be activated. Therefore, with a day temperature of 20 and a differential of 03 the summer fan relay will be activated at 23°C. The minimum differential is 02 and the maximum is 06°C.

SENSOR

The Benson CP4 has an internal sensor which is disabled as a factory default. To enable it, select 1 for Yes when prompted.

INTERNAL SENSOR
N<0> Y<1> : 0

The Benson CP4 has averaging facility. The system will automatically calculate and display the average reading when any two sensors (internal or remote) are detected.

You are now prompted to calibrate the first sensor, if you have enabled the internal sensor you will calibrate this first followed by 1 remote sensor.

CALIBRATE (20)
INTERNAL : 23

If you have not enabled the internal sensor you are prompted to calibrate the first and then second remote sensor.

CALIBRATE (19)
REMOTE 1 : 20

To calibrate, simply enter the new sensor reading after the colon.

EXTRA

SERVICE MODE

From the Normal Run Mode, enter the engineers code and press 4 for Setup, 4 for Extras followed by 1 for Service mode.

You are now prompted to:

- 1> Configure the service mode or
- 2> Reset the current hours run total held in the unit

1> CONFIGURATION
2> RESET DATA

Pressing 1 to configure the unit will display the following screen and will ask you to turn the service mode on or off.

SERVICE MODE
N<0> Y<1> : 0

You are now required to enter the number of hours the system may run before the service mode should be Activated. Press Enter to accept the programmed setting.

SERVICE MODE
HOURS RUN: 0000

You should now enter the phone number that you want displayed when a service

SERVICE MODE
CALL : 0000000000

SERVICE ALARM ACTIVATED

When a service alarm has been activated a warning screen will be displayed for 5 seconds every minute. You are able to cancel this warning by pressing RESET whilst the warning display is on screen.

Remember that you will not receive further service alarms until the control has been reset by an engineer.

RESETTING THE SERVICE ALARM

After a service alarm has been activated you are able to reset the hours setting without the need to reprogram the telephone number by selecting Reset from the Configuration/Reset screen.

SYSTEM RESET

This function resets the Benson CP4's settings back to the factory default.

To put the control through a reset:

- Press 4 for Setup
- Press 4 for Extra
- Press 2 for Reset

RESET ALL DATA? ENTER TO CONFIRM

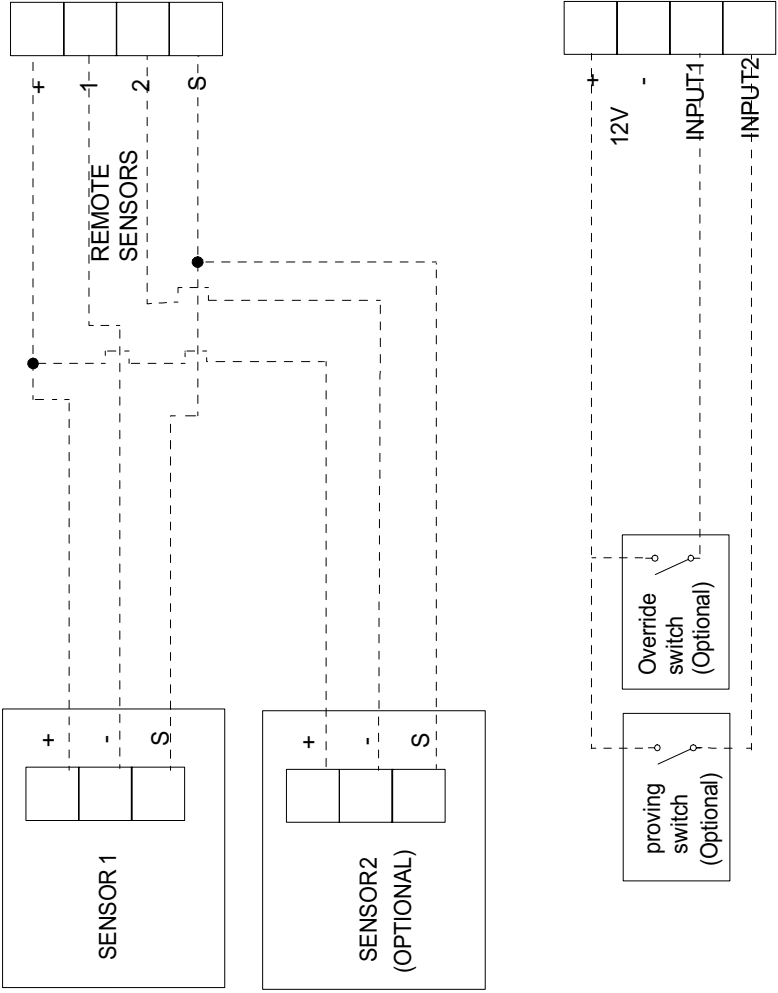
- Pressing ENTER at this point will erase all data. To abort press the DELETE Key.
-

SYSTEM SPECIFICATIONS

Enclosure:	ABS Fire Retardant
Dimensions:	222mm x 156mm x 61 mm (Length, Height,Depth)
Weight:	1.3 kg
Relays:	Relay 1-3 normally open contacts Relay 4 normally open, normally closed contacts 10 amp 230v rating relays 1-3
Alarm Input:	230v AC. 5mA Max.
Supply:	230v AC \pm 10% 50Hz
Sensors:	Only use Heatmiser Sensors. Twin screened cable (Beldon 8451)
Battery:	3 years (Replacement battery: CR2430)
Fuses:	FS1: 800mA Antisurge FS2: 315mA Quick blow FS3: 315mA Quick blow

Sensor and input wiring

Beldon 8451 (RS 360-649) Twin, Screened cable must be used when connecting the remote sensors



PRIMROSE HOUSE,
 PRINCES STREET,
 DARMEN, HANTS, RG39 2DE
 TEL NO 01264 78346
 FAX NO 01264 76146

DRAWN	CLIENT
A.S.	
SCALE	
N.T.S.	
REF.	
PROJECT	
CP4	

SHEET	1	OF	1
DWG No 01			